

CONTEMPORARY VERTICAL CRUSTAL
MOVEMENTS IN SOUTHERN ONTARIO

by

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Contemporary Vertical Crustal Movements in Southern Ontario

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1. Introduction

This report describes the used procedures, data and results of a study undertaken by the author on behalf of the University of New Brunswick for the Earth Physics Branch, Department of Energy, Mines and Resources under a research contract OSU5-0252, DSS file no. OLSU.23235-5-1851, dated February 13, 1976. The object of the study is the vertical crustal movements in southern Ontario and north shore of Lake Superior.

The report is divided into four main parts and contains five Appendices. The first main part (2) deals with the brief description of the procedures used and is complemented by Appendix I. Next part (3) is devoted to the discussion of the levelling data assembled for this study. The third main part (4) describes the second kind of data used here - the lake level data. The information contained therein is supplemented in Appendices II and III. Results are discussed in the last main section (5), which also contains the graphical representation of the detected movements. Appendices IV and V consist of graphical and numerical display of all the used input data and their residuals.

2. General Description of the Approach Used

2.1 Available Data

There are two kinds of routinely available data for this type of a study in Ontario: repeated geodetic levellings and water level gauge readings from Great Lakes. Each levelling between a pair of

permanent bench marks gives a levelled height difference of these bench marks. A releveling of the same pair carried out at a later time yields another height difference. Hence, the two levellings of one segment, which we shall call here, for brevity, a "relevelled segment", supply us with the change in tilt that the two end points had undergone in the period between the two levellings. It can be shown that thus determined change in tilt is related to gravity equipotential surfaces and not to any "absolute" coordinate system fixed in the earth.

There are several dozens of permanent water level gauges operating on Great Lakes. These record water level variations with respect to the land. Hence the recorded variations reflect both water as well as land elevation changes. In particular, a pair of gauges located on the same lake are affected in a similar manner by the lake water level variations. Thus, the difference in the two records from the paired gauges is only slightly influenced by the water variations being sensitive only to differences in local conditions. On the other hand, the land tilt changes between the two gauges have full impact and should be clearly discernible in the difference of the two records.

2.2. Method Used

While water level gauges record vertical crustal movements (among other effects) continuously, the levelling data, i.e. the bulk of the data, represent a very poor sample in time. Therefore, except for the water gauges, there is no hope for discovering any time-irregularities in the movements. The only feature modelable at present in the whole region of interest is the linear component of the movements.

Moreover, the segments for which the tilt variation is known, whether they originate in levelling or water level readings, are scattered irregularly over the area (cf. Appendix IV). To bridge the gaps among these segments a technique developed in the Department of Surveying Engineering, U.N.B. is used.

This technique models the vertical movements as varying smoothly from point to point in space under the assumption of their velocity being constant in time for any point. The velocity, rather than the movements, is then modeled spatially. A two-dimensional algebraic polynomial of arbitrary order is used for this purpose.

Once the order of the polynomial is selected, the coefficients of the polynomial are determined so that the surface fits the tilt segments in the best possible way - in the least squares sense. Full description of this technique is given in Appendix I.

2.3 Results and Their Accuracy

Using the above described method we can generate velocity surfaces of different order. For expediency, the geodetic coordinates ϕ , λ of the end points of segments are transformed into a local orthogonal system (x, y) through transformation equations:

$$x = (\lambda_0 - \lambda)/10$$

$$y = (\phi - \phi_0)/10 ,$$

where all the latitudes and longitudes are in minutes of arc. ϕ_0 , λ_0 are coordinates of an origin selected to fall close to the centre of the region of interest.

Because of the relative nature of the input information (tilt changes rather than absolute movements) the computed velocity surface

can also be only relative. Mathematically there is no way to determine the absolute term of the algebraic polynomial from the given data alone. However, if the absolute velocity of at least one point in the area is known then absolute velocity surface can be also obtained by adding an appropriate absolute term to the relative surface.

Evidently, not all the coefficients may be determined with the same accuracy from a particular data set. Depending on the spatial distribution of segments, some coefficients are better determined than others. In order not to let the poorly determined coefficients influence the shape of the surface they may be discarded. This is easily done in an orthogonal solution space where the coefficients by orthogonalized functions are not correlated. Thus they can be compared directly against multiples of their own standard deviations and failing to be significantly different from zero discarded. This filtering process is described in some detail in Appendix I.

Finally, the accuracy of the solution can be assessed. There are two kinds of accuracy estimates incorporated in this technique. First is the a posteriori variance factor $\hat{\sigma}_0$ (cf. - Appendix I) that characterises the goodness of the weights of input data and the appropriateness of the selected model (i.e. the algebraic polynomial) for the given input data set. The closer it is to 1, the more successful was the selection of weights and the model.

The second way of assessing accuracy is by computing the standard deviation of predicted velocity at each point by using the covariance matrix of the coefficients (cf. Appendix I). These standard deviations can be once more portrayed in terms of a surface. Such a surface depicts the degree of accuracy deterioration with increasing distance from the

origin (ϕ_0, λ_0). It hence depends on the choice of origin.

3. Levelling Data

3.1 Data Acquisition

Levelling data was acquired from two agencies: Geodetic Survey of Canada (Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa) and Surveys and Plans Office (Province of Ontario, Toronto). Around 6000 field records were searched for relevelled segments of first and second order levellings.

Altogether, there are about 230 first order and 15 second order level lines in the area. These are composed of approximately 9500 first order and 1200 second order bench marks of federal provenience and 1300 first order provincial bench marks.

The search yielded close to 1000 relevelled segments. From these, 90 consist of one first and one second order levellings. The remaining segments were all levelled twice with first order accuracy.

3.2 Data Preparation and Screening

The collected segments were then summarised and prepared to be put into a computer readable form. For each segment it was necessary to determine: the two observed level differences, the ϕ and λ of the two end-point bench marks and to evaluate the weight. The weights reflect the length of the segments, the time span between the levellings and the order of the levellings (cf. Appendix I).

It was assumed that the actual standard deviation of a first order height difference is 1.3 mm times the square root of the length of the segment in kilometres [Boal, 1971]. Second order levelling is assumed to be twice less precise [Surveys & Mapping Branch, 1961].

The punched data was then screened for blunders in height differences as well as in horizontal locations. Segments showing anomalously large change in tilt, improper location of one end point (upon a visual inspection of graphical display), or suspiciously long distance between the end points were checked. If found to have been incorrectly calculated or punched, they were corrected and returned into the data set. Otherwise, they were eliminated. Segments whose end points were closer together than 0.1 minutes of arc were also eliminated.

Next check was for anomalous local uplifts or subsidences that showed up as large residuals after the velocity surfaces were first computed. These anomalies are particularly noticeable on bench marks that are common to two adjacent segments. The segments both display larger residuals of similar magnitude but opposite signs. Such bench marks were eliminated by joining the two segments into one.

3.3 Input Data Set

The result of this screening was an input data set of 833 segments ranging between 200 metres and 55 kilometres in length. The interval between the two successive levellings varies for these segments from 1 to 62 years.

This data set is listed in Appendix V together with the residuals for all three used orders of velocity surface. The location and length of individual segments can be seen in Appendix IV.

From the graphical display of the input data set we notice the usually experienced irregular distribution of segments and their

sparseness particularly in the northern region. Rather unfortunate is the lack of north-south running segments north of lakes Superior and Huron. As we shall see in 5, this lack prevents us from being able to establish meaningful north-south slope of the velocity surfaces in that part of the area of interest.

4. Lake Level Data

4.1 Data Acquisition

The first step in acquiring the lake level data was the selection of 20 Canadian gauging stations on Great Lakes from Water Levels 1974 [Marine Environmental Data Service, 1975]. The selection is described in Appendix III and so is the process of obtaining the input data for our study.

It was only after all our analyses had been carried out that we acquired the results of similar analyses done by Bolduc [1976]. Since Bolduc's results appear to have been obtained in a more thorough manner (see later) and because Bolduc also treats some U.S. gauges that are located so that they complement the location of relevelled segments, we decided to use primarily Bolduc's results in our investigation.

The first data set was thus obtained by merging 32 of Bolduc's pair of gauges (c.f. Appendix II) with 7 additional pairs from our own analyses (c.f. Appendix III). The remaining 18 of Bolduc's pairs were omitted because they contain gauges from Lake Michigan from the vicinity of which we have no relevelled segments; only Canadian levelling data was used.

Our own pairs, involving either of the following gauges: Little Current and Point Edward, both on Lake Huron, were disregarded - in spite of their favourable locations vis-a-vis the levelling segments - since

the records at these two places do not reflect real level variations [c.f. Forrester, 1961] because of local currents.

4.2 Data Treatment

The technique used in our analyses to obtain the linear tilt variation between individual pairs of gauges is described in detail in Appendix III. Bolduc's method is essentially identical to ours with the exception that monthly mean water levels from June till September of each common year were used instead of our annual means. Also a minimal length of records was selected to be 40 years instead of our 10. Comparison of results for pairs obtained from both approaches reveals no significant differences. However, Bolduc's standard deviations show a higher degree of reliability of his results.

The weights of the paired gauge segments were determined from the standard deviations of the slope of the fitted straight line following the procedure described in [Vaniček, 1975] and in Appendix III.

Proper assessment of weights allowed us then to merge these gauge-pairs with the relevelled segments into one data set. The location of used pairs is shown graphically in Appendix IV. The numerical values of indicated tilt variations, normalised for 100 years, are listed together with the relevelled segments in the three listings in Appendix V - last 39 values. These listings also give the weights of these pairs as well as their residuals for all three velocity surfaces.

5. Results

5.1 Numerical Results and Their Graphical Representation

Three velocity surfaces of orders 2, 3 and 4 were generated using the same input data set. The resulting coefficients are summarised in Tables 1 to 3.

Table 1

Power of x Power of y	0	1	2
0	22.350	2.7148	0.0546
1	0.8820	0.0152	0.0015
2	0.0050	0.0002	-0.000 ₃

Coefficients of 2nd Order Surface

Table 2

Power of x Power of y	0	1	2	3
0	23.041	3.1581	0.0295	-0.0031
1	0.8433	-0.0332	0.0006	0.0001
2	0.0000 ₇	-0.0013	-0.0000 ₅	< 10 ⁻⁵
3	-0.0001	0.0000 ₂	< 10 ⁻⁵	< 10 ⁻⁵

Coefficients of 3rd Order Surface

Table 3

Power of y / Power of x	0	1	2	3	4
0	23.604	3.1375	0.1004	-0.0057	-0.0002
1	0.7073	0.1129	-0.0088	-0.0000 ₆	-0.0000 ₁
2	-0.0053	-0.0074	0.0007	0.0000 ₁	< 10 ⁻⁵
3	-0.0002	0.000 ₇	-0.0000 ₁	0.0000 ₁	< 10 ⁻⁵
4	0.0000 ₁	< 10 ⁻⁵	< 10 ⁻⁵	< 10 ⁻⁵	< 10 ⁻⁵

Coefficients of 4th Order Surface.

Tables 4 to 6 contain the covariance matrices of the coefficients. The numbers of columns and rows correspond to the position of the coefficient in Tables 1 to 3 taken sequentially row by row.

Table 4

VARIANCE COVARIANCE MATRIX OF COEFFICIENTS

	1	2	3	4	5
1	0.54572D-01				
2	0.68752D-03	0.11340D-03			
3	-0.65151D-02	0.87120D-05	0.27106D-01		
4	-0.15149D-02	0.49318D-04	0.23874D-02	0.31103D-03	
5	0.78038D-04	-0.31106D-05	0.22129D-04	-0.31239D-05	0.48053D-05
6	-0.79476D-04	0.35088D-05	0.44344D-03	0.44561D-04	0.43760D-05
7	-0.29341D-04	-0.14744D-05	0.77172D-04	0.65879D-05	0.12067D-06
8	-0.35376D-05	0.10132D-07	0.33345D-05	0.42054D-06	-0.68433D-08
	6	7	8		
6	0.93989D-05				
7	0.13248D-05	0.27715D-06			
8	0.55892D-07	0.10834D-07	0.73554D-09		

Covariance Matrix of Coefficients, 2nd Order Surface

Table 5

VARIANCE COVARIANCE MATRIX OF COEFFICIENTS

	1	2	3	4	5
	0.81386D-01				
2	0.42185D-03	0.38177D-03			
3	-0.19482D-03	0.17016D-07	0.26644D-05		
	-0.19188D-02	-0.21493D-03	0.77911D-05	0.15963D-01	
	-0.20296D-02	0.25051D-03	-0.54526D-05	0.11960D-02	0.65760D-03
c	0.47936D-04	-0.89090D-05	0.32362D-05	-0.18538D-04	-0.27189D-04
7	0.12268D-04	0.69128D-06	-0.11716D-06	-0.20178D-05	0.50339D-06
	0.13809D-03	-0.19496D-05	0.24904D-05	0.14229D-03	-0.12290D-04
	-0.61486D-04	-0.28705D-05	0.17443D-05	0.18082D-04	-0.30501D-05
1	0.22328D-06	0.12396D-05	-0.16898D-06	0.29029D-05	0.29915D-05
11	0.13939D-06	-0.79372D-08	-0.16522D-08	0.59373D-08	-0.20117D-07
12	-0.14209D-05	-0.24957D-06	0.14435D-06	-0.25982D-05	-0.11628D-05
1	0.16593D-05	0.88873D-07	-0.29307D-07	0.18206D-06	0.10295D-06
1	-0.15306D-07	0.21882D-08	-0.83503D-10	0.43007D-08	0.60018D-08
15	-0.59720D-08	0.85378D-09	-0.32561D-10	0.16780D-08	0.23418D-08
	6	7	8	9	10
	0.63268D-05				
7	-0.12552D-06	0.72702D-08			
	0.61387D-05	-0.49480D-07	0.30007D-04		
	0.28141D-05	-0.71573D-07	0.40439D-05	0.15471D-05	
1	-0.31054D-06	0.28423D-08	-0.27024D-06	-0.12090D-06	0.22570D-07
11	-0.21282D-08	0.47285D-10	-0.28845D-08	-0.15541D-08	0.12956D-10
12	0.27042D-06	-0.49486D-08	0.64980D-06	0.14574D-06	-0.14309D-07
1	-0.40791D-07	0.14675D-08	0.23630D-07	-0.18473D-07	0.20066D-08
1	-0.26980D-09	0.63439D-11	-0.55514D-09	-0.60093D-10	0.31157D-10
15	-0.10527D-09	0.24753D-11	-0.21660D-09	-0.23447D-10	0.12157D-10
	11	12	13	14	15
11	0.28858D-11				
12	-0.12503D-09	0.20553D-07			
1	0.19111D-10	-0.81626D-09	0.49921D-09		
1	-0.20759D-12	-0.17857D-10	0.86782D-13	0.68462D-13	
1	-0.80998D-13	-0.69673D-11	0.33367D-13	0.26712D-13	0.10423D-13

Covariance Matrix of Coefficients, 3rd Order Surface

Table 6

VARIANCE COVARIANCE MATRIX OF COEFFICIENTS

1	0.36436D+00				
2	-0.16335D-01	0.25586D-02			
3	-0.18421D-02	0.71326D-04	0.16385D-04		
4	-0.18551D-04	-0.13226D-05	0.13827D-06	0.93982D-08	
5	-0.60817D-01	0.87523D-02	0.51934D-03	0.91313D-06	0.84473D-01
6	-0.11935D-01	0.31568D-02	0.24567D-04	-0.38135D-05	0.17254D-01
7	0.15894D-02	-0.20627D-03	0.29313D-05	0.23270D-06	-0.13287D-03
8	0.48412D-05	-0.15308D-05	-0.27450D-06	0.11166D-07	-0.23755D-04
9	-0.19853D-05	0.15794D-06	0.19729D-07	-0.41293D-09	0.14225D-05
10	-0.39948D-02	0.55443D-03	0.35707D-04	0.10239D-06	0.46532D-02
11	-0.30085D-03	-0.75360D-05	0.45286D-05	0.19431D-06	0.76851D-03
12	-0.15511D-04	0.82973D-05	-0.59582D-06	-0.15341D-07	0.23489D-05
13	0.59692D-05	-0.56194D-06	-0.49622D-07	-0.59975D-09	-0.19778D-05
14	0.84823D-07	-0.73725D-08	-0.11304D-08	0.22341D-10	-0.30683D-07
15	-0.47618D-05	-0.16938D-05	0.13778D-06	0.52282D-08	-0.20590D-05
16	-0.68823D-05	-0.85732D-07	-0.11987D-07	-0.14230D-08	-0.55358D-05
17	0.14449D-05	-0.65751D-07	0.37200D-08	0.20170D-09	0.12696D-06
18	-0.47021D-07	0.15600D-07	-0.14305D-08	-0.78925D-11	0.16747D-07
19	0.44637D-08	-0.34517D-09	-0.63423D-11	-0.66229D-12	-0.14145D-08
20	0.11397D-05	-0.16557D-06	-0.10560D-07	-0.11459D-09	-0.16396D-05
21	0.19753D-07	-0.36279D-08	0.17131D-09	0.14163D-11	-0.53047D-06
22	-0.31489D-08	0.57834D-09	-0.27309D-10	-0.22577D-12	0.84559D-09
23	0.14283D-09	-0.26232D-10	0.12397D-11	0.10240D-13	-0.36358D-10
24	-0.60235D-10	0.11063D-10	-0.52240D-12	-0.43188D-14	0.15178D-10
6	0.69631D-02				
7	-0.24151D-03	0.37569D-04			
8	-0.10036D-04	-0.27309D-06	0.59758D-07		
9	0.10573D-06	-0.78190D-08	-0.14924D-08	0.10202D-09	
10	0.92712D-03	-0.30540D-05	-0.11550D-05	0.21776D-07	0.30155D-03
11	-0.27121D-04	0.74160D-05	0.17639D-06	-0.11802D-07	0.25214D-04
12	0.16855D-04	-0.17141D-05	0.66999D-08	-0.62043D-09	-0.45440D-06
13	-0.44933D-06	0.88748D-07	-0.32652D-08	0.92165D-10	-0.10883D-06
14	-0.12331D-07	-0.67772D-10	0.11139D-09	-0.51821D-11	-0.20484D-08
15	-0.45124D-05	0.28241D-06	0.51895D-08	-0.27452D-10	-0.12611D-07
16	-0.60919D-06	-0.73083D-07	-0.12619D-08	0.20575D-09	-0.34423D-05
17	-0.11238D-06	0.14304D-07	0.12619D-08	0.00279D-10	0.11290D-07
18	0.28366D-07	-0.34399D-08	0.55111D-10	-0.48923D-11	-0.11530D-09
19	-0.12793D-09	0.51729D-10	-0.27479D-11	0.70979D-13	-0.81953D-10
20	-0.28053D-06	-0.24866D-06	0.16499D-07	0.58217D-11	-0.16407D-05
21	-0.49839D-09	0.71415D-09	-0.16165D-10	0.57908D-12	-0.12518D-09
22	0.79450D-09	-0.11385D-09	0.25770D-11	-0.92315D-13	0.20431D-10
23	-0.36036D-10	0.51638D-11	-0.11688D-12	0.41871D-14	-0.92558D-12
24	0.15198D-10	-0.21778D-11	0.49295D-13	-0.17659D-14	0.39082D-12
11	0.74282D-05				
12	-0.46291D-06	0.11196D-06			
13	-0.20715D-07	-0.36659D-08	0.48114D-09		
14	0.51184D-09	0.34060D-10	-0.61334D-11	0.30289D-12	
15	0.13724D-06	-0.21551D-07	0.11718D-09	0.36102D-11	0.55429D-09
16	-0.74156D-07	0.21929D-08	-0.21267D-09	-0.85413D-11	-0.57369D-09
17	0.63861D-08	-0.79667D-09	0.68175D-11	0.42152D-12	0.19409D-09
18	-0.22741D-09	0.24019D-09	-0.14135D-10	0.26731D-12	-0.35559D-10
19	-0.21210D-10	-0.17303D-11	0.34992D-12	-0.49154D-14	-0.14312D-12
20	-0.11404D-07	0.27500D-09	0.45574D-10	-0.23443D-13	-0.37671D-10
21	0.44028D-10	-0.40260D-10	0.25990D-11	-0.37322D-13	0.56471D-11
22	-0.70188D-11	0.64180D-11	-0.41432D-12	0.59497D-14	-0.90324D-12
23	0.31935D-12	-0.29110D-12	0.13793D-13	-0.26966D-15	0.40832D-13
24	-0.13426D-12	0.12277D-12	-0.79256D-14	0.11381D-15	-0.17221D-13
16	0.10859D-08				
17	-0.65217D-10	0.86379D-11			
18	-0.41039D-11	-0.11224D-11	0.67840D-12		
19	0.18787D-12	-0.29874D-14	-0.89171D-14	0.26602D-15	
20	0.16001D-09	-0.70558D-11	-0.26103D-12	0.37269D-13	0.38744D-10
21	0.24726D-12	0.21512D-12	-0.11173D-12	0.16804D-14	0.64448D-13
22	-0.39417D-13	-0.34294D-13	0.17811D-13	-0.26785D-15	-0.10274D-13
23	0.17879D-14	0.15550D-14	-0.80750D-15	0.12150D-16	0.46600D-15
24	-0.75401D-15	-0.65601D-15	0.34070D-15	-0.51243D-17	-0.19553D-15
21	0.19354D-13				
22	-0.30854D-14	0.49186D-15			
23	0.13994D-15	-0.22309D-16	0.10119D-17		
24	-0.59020D-16	0.94087D-17	-0.42675D-18	0.17998D-18	

Covariance Matrix of Coefficients, 4th Order Surface

In all three cases the origin of the local (x, y) coordinate system (c.f. 2.3) is located at:

$$\phi_0 = 46^{\circ}30.8'$$

$$\lambda_0 = 84^{\circ}20.7''$$

The absolute terms were computed so as to make the vertical velocity at point

$$\phi = 46^{\circ}15'$$

$$\lambda = 84^{\circ}00'$$

equal to +20 centimetres per century. This rate was chosen in accordance with Walcott's [1972] findings. Thus all the computed velocities are related to this rate at the chosen location.

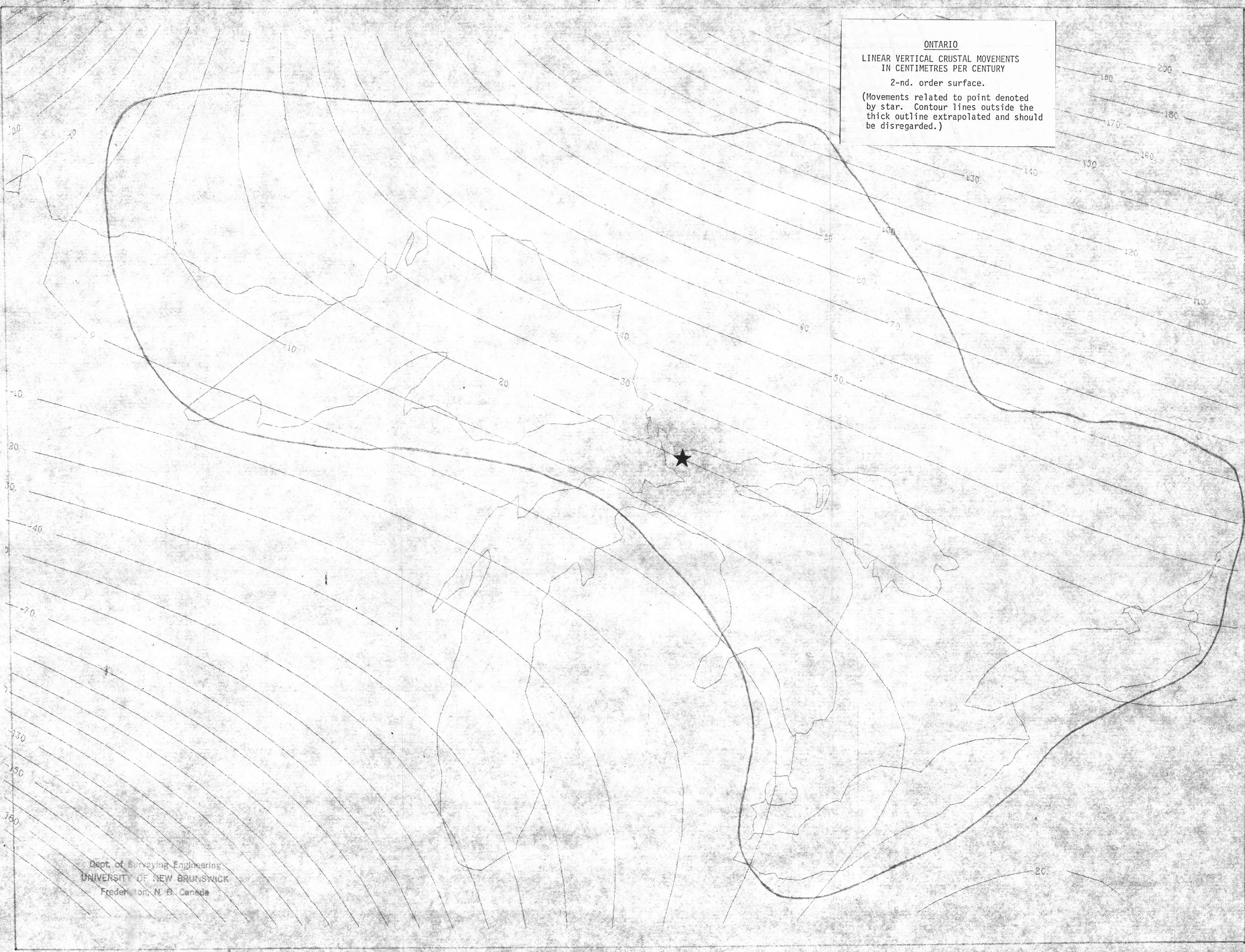
For all three surfaces the coefficients were filtered on one standard deviation level (c.f. 2.3). This filtering resulted in the omission of respectively 1, 5, and 11 coefficients in the orthogonal solution space, leaving only 8, 11, and 14 statistically significant "orthogonal" coefficients. However, since the coefficient by the highest power was in all three cases significant, we have, after transforming the solution back to its original space, all 9, 16, and 25 coefficients present.

The three computer produced surfaces are shown, together with their standard deviations, on the following 6 maps, drawn to a scale of 1:2,750,000. No attention should be paid to contours outside the area delineated by the thick line. There are no data outside that area.

5.2 Discussion of Results

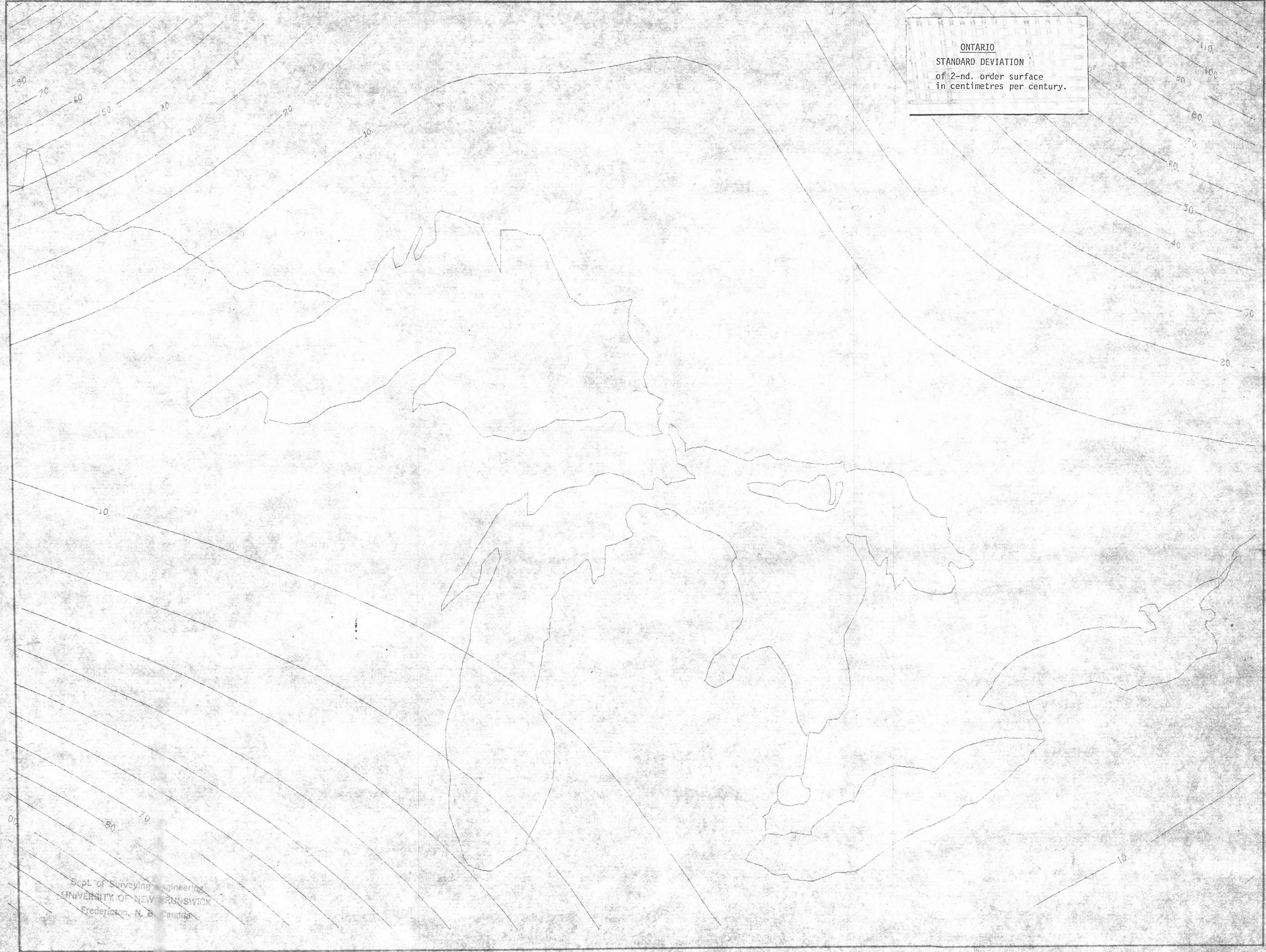
Judging from the values of the a posteriori variance factor $\hat{\sigma}_0$ (c.f. 2.3), the low order surface and the weighting procedure were

ONTARIO
LINEAR VERTICAL CRUSTAL MOVEMENTS
IN CENTIMETRES PER CENTURY
2-nd. order surface.
(Movements related to point denoted
by star. Contour lines outside the
thick outline extrapolated and should
be disregarded.)



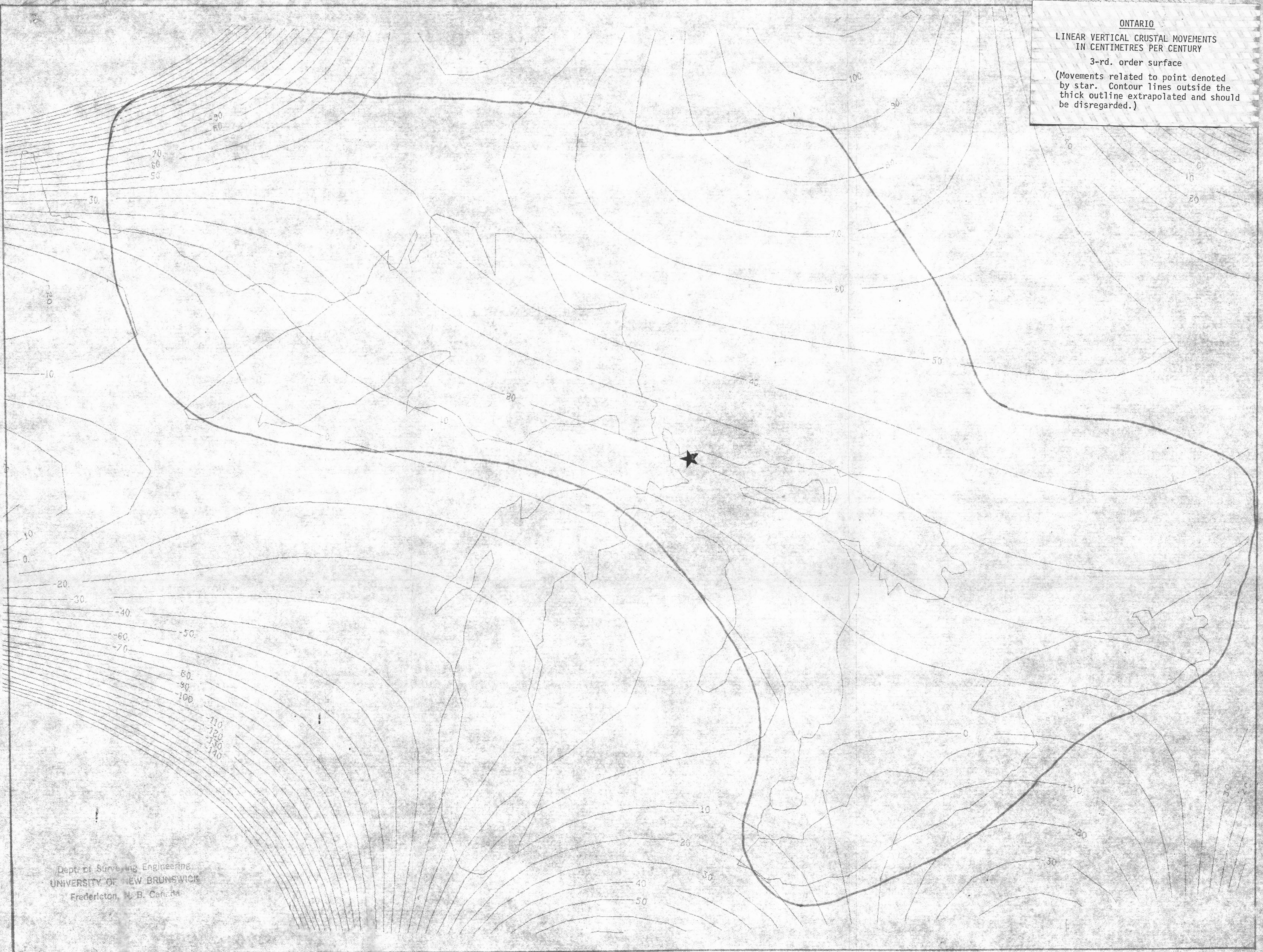
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ONTARIO
STANDARD DEVIATION
of 2-nd. order surface
in centimetres per century.



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ONTARIO
LINEAR VERTICAL CRUSTAL MOVEMENTS
IN CENTIMETRES PER CENTURY
3-rd. order surface
(Movements related to point denoted
by star. Contour lines outside the
thick outline extrapolated and should
be disregarded.)



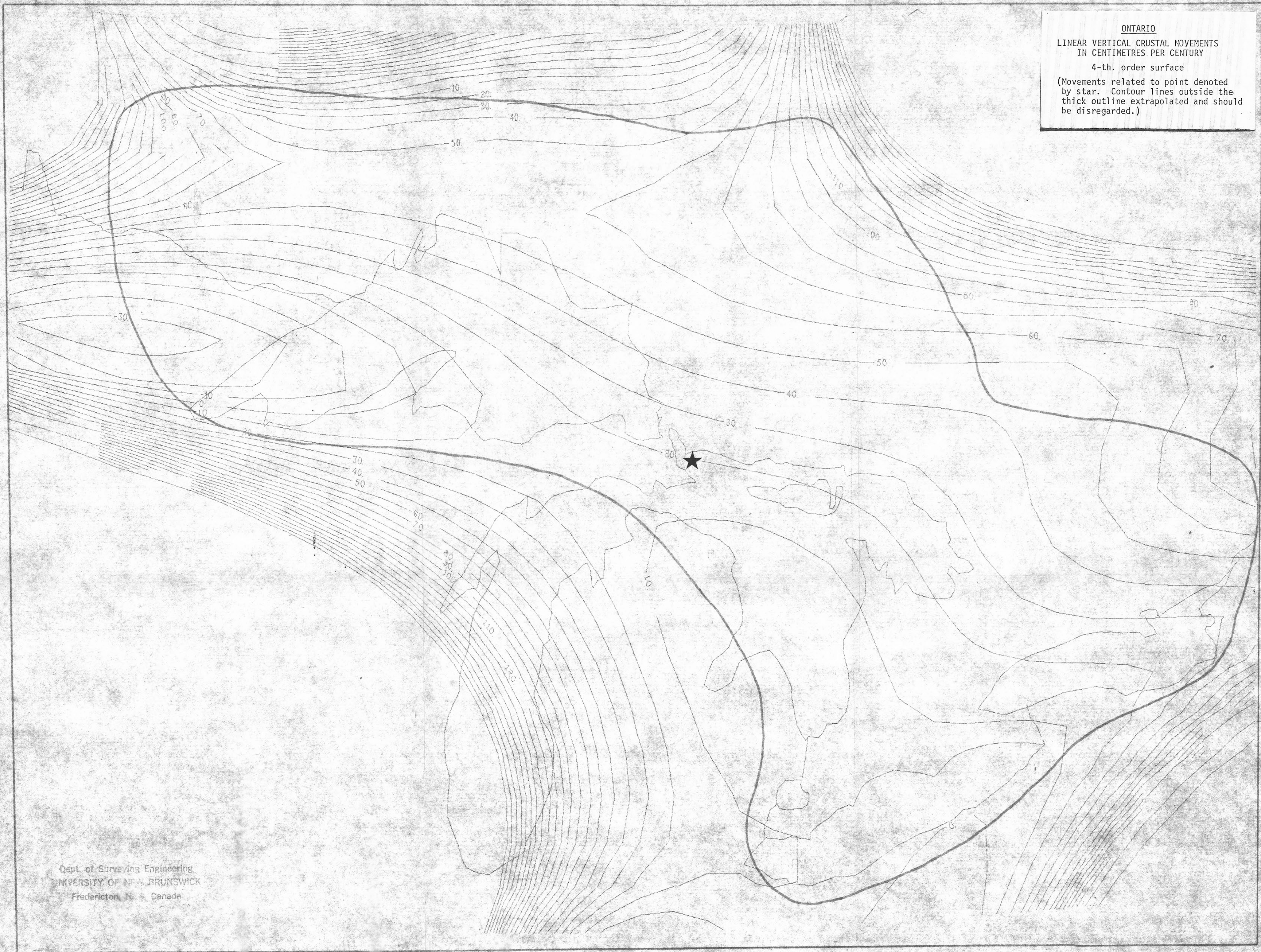
Dept. of Surveying Engineering
UNIVERSITY OF NEW BRUNSWICK
Fredericton, N. B. Canada

ONTARIO
STANDARD DEVIATION
of 3-rd. order surface
in centimetres per century.



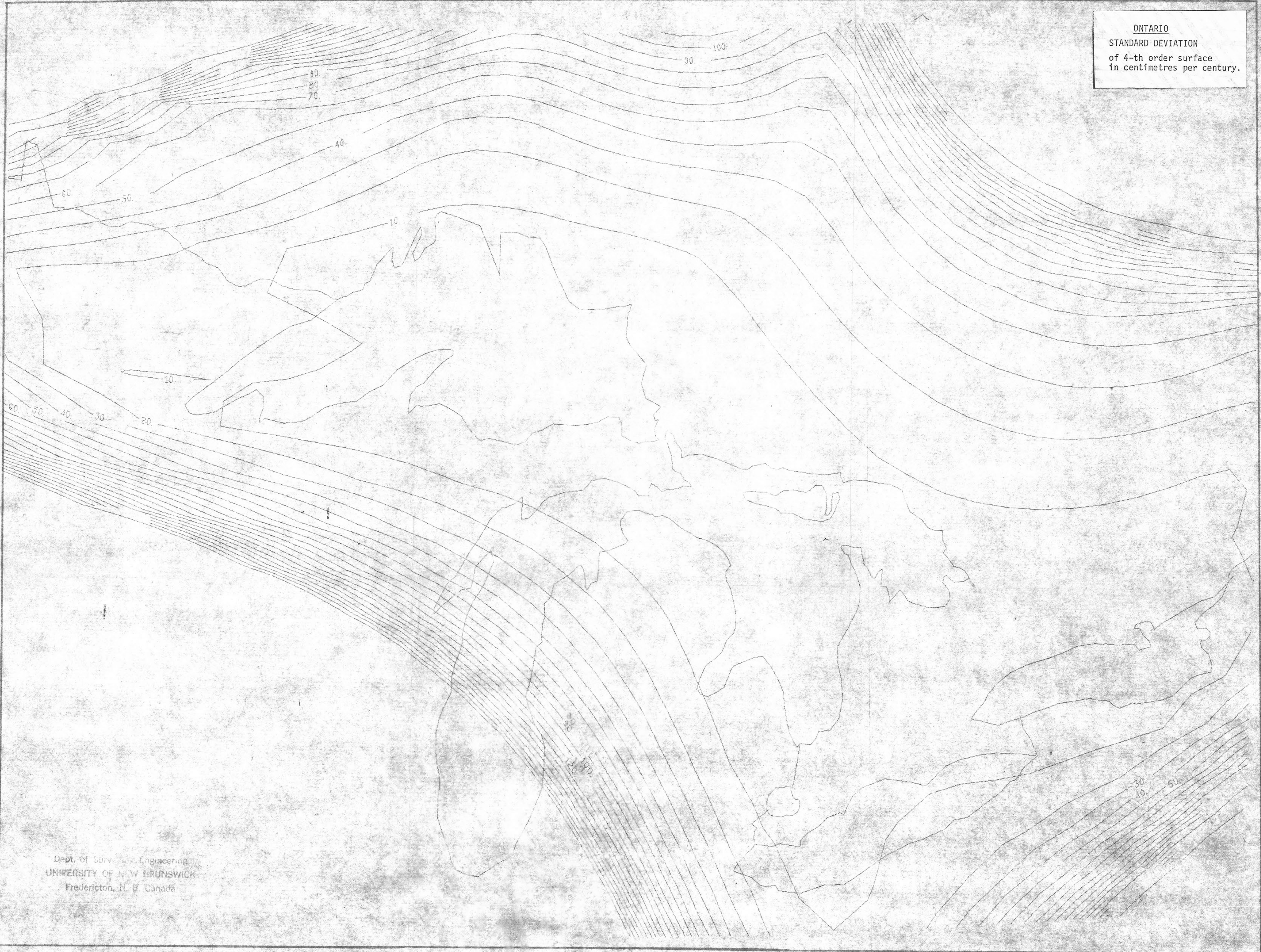
Dept. of Surveying, Engineering
UNIVERSITY OF NEW BRUNSWICK
Fredericton, N. B. Canada

ONTARIO
LINEAR VERTICAL CRUSTAL MOVEMENTS
IN CENTIMETRES PER CENTURY
4-th. order surface
(Movements related to point denoted
by star. Contour lines outside the
thick outline extrapolated and should
be disregarded.)



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ONTARIO
STANDARD DEVIATION
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in centimetres per century.



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Fredericton, N. B. Canada

selected appropriately enough. The obtained values of $\hat{\sigma}_0$ for the three orders are:

$$\text{2nd order: } \hat{\sigma}_0 = 2.942$$

$$\text{3rd order: } \hat{\sigma}_0 = 2.942$$

$$\text{4th order: } \hat{\sigma}_0 = 2.951$$

all close enough to 1.

The fact that the three values are so close together shows that neither of the surfaces can be considered significantly more appropriate than the others. Even the values of the a posteriori factors evaluated before the filtering of coefficients, i.e.:

$$\text{2nd order: } \hat{\sigma}'_0 = 2.938$$

$$\text{3rd order: } \hat{\sigma}'_0 = 2.925$$

$$\text{4th order: } \hat{\sigma}'_0 = 2.913 ,$$

display no significant decrease with the order and cannot therefore be used to select the best solution by.

A brief look at the three velocity surfaces discloses that the main north-north-east slope is present on all three solutions and with the exception of the poorly controlled north-west corner, the solutions are fairly similar. The north-west corner is controlled mainly by the north-west going spur of relevelings made within a span of only three years and therefore carrying little weight.

The mentioned main slope is presumably due to the post-glacial rebound and agrees well with the pattern shown by Walcott [1972]. The saddle point on the north shore of Lake Superior, noticeable on the 3rd and 4th order surface is probably of a spurious nature since there is practically no data to support it. All of the relevelled segments in this area run more or less east-west and hence the north-south slope is poorly determined.

As one may expect, the higher order solution accuracy deteriorates more rapidly towards the edges of the controlled area. This is clearly visible on the plots of the standard deviations and is explainable by higher flexibility of the higher order surfaces.

To conclude with, we note that there is practically no correlation between the movements and topography. The coefficients of correlation [Vaníček and Hamilton, 1972] for the three solutions are

2nd order: $\rho = 0.015$

3rd order: $\rho = 0.016$

4th order: $\rho = 0.015$.

6. Acknowledgements

We should like to acknowledge the assistance rendered to us by Mr. P.A. Bolduc, Marine Environment Data Service, Ocean and Aquatic Sciences, who made available to us the preprint of his paper cited in this report. Messrs. F. Young and J. Murakami, Geodetic Survey of Canada, provided us with kind help in searching the Federal levelling data files for relevelled segments and in the determination of horizontal positions of bench marks. Our thanks go also to Messrs. W.D. Ratz and T.S. Foreman, Surveys and Plans Office, Province of Ontario, as well as their staff for their assistance with collecting levelling data from the Provincial data files. Mrs. I.M. Paim, Messrs. B. Fletcher and H. Karabela of this department bore the brunt of the data preparation and handling. Miss J. Crawford's expertise in computer programming was invaluable to us throughout the work.

7. References

- Boal, J.D. (1971): A Restatement of the Basis for Revised Levelling Specifications, Interim Report No. 3, Geodetic Survey of Canada, Ottawa.
- Bolduc, P.-A. (1976): Apparent Vertical Movement Over the Great Lakes, Preprint.
- Forrester, W.D. (1961): Tidal and Meteorological Influences on the Current in Little Current Channel. Canadian Hydrographic Service, Dept. of Energy, Mines and Resources, Ottawa.
- Marine Environmental Data Service (1975): Monthly and Yearly Mean Water Levels 1974, Dept. of the Environment, Ottawa.
- Surveys and Mapping Branch (1961): Specifications for Control Surveys, S & M Tech. Instruction No. 1, Ottawa.
- Vaniček, P. and A.C. Hamilton (1972): Further Analysis of Vertical Crustal Movement Observations in the Lac St. Jean Area, Quebec, Can. J. Earth Sci. 9, 1139-1147.
- Vaniček, P. (1975): Vertical Crustal Movements in Nova Scotia as Determined from Scattered Geodetic Relevelling, Tectonophysics 29, 183-189.
- Walcott, I.R. (1972): Late Quaternary Vertical Movements in Eastern North America: Quantitative Evidence of Glacio-Isostatic Rebound, Rev. Geoph. Sp. Phys., 10, 4, 849-884.

APPENDIX I

DESCRIPTION OF METHOD

- (i) "A Method for the Evaluation of Vertical Crustal
Movement from Scattered Geodetic Relevelings"
by P. Vaníček and D. Christodulidis

A Method for the Evaluation of Vertical Crustal Movement from Scattered Geodetic Relevelings

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Received October 9, 1973

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The existing techniques for the quantitative evaluation of vertical crustal movements from geodetic spirit levelling have one common feature. They can deal only with a complete network of systematically relevelled connected lines. This paper presents a method, based on the least-squares fitting of a velocity surface, capable of using scattered as well as connected relevelled segments. A facility to choose a specific level of statistical significance of the results is built in. The performance of the method is tested on data for the vicinity of Chesapeake Bay. The results compare well with those of the U.S. National Geodetic Survey.

Les techniques existantes pour l'évaluation quantitative des mouvements verticaux de la croûte terrestre à partir de levés de nature géodésiques ont un trait commun. On ne peut les utiliser qu'avec un maillage complet de lignes jointes relevées systématiquement. Cet article présente une méthode, basée sur l'ajustement des moindres carrés d'une surface de vitesse capable d'utiliser des segments éparpillés, aussi bien que des segments unis. Il est montré dans cette méthode comment choisir un levé spécifique de signification statistique des résultats. Le rendement de la méthode fut testé sur des données prises dans les environs de Chesapeake Bay. Les résultats sont très comparables à ceux du 'U.S. National Geodetic Survey.'

[Traduit par le journal]

Introduction

Results of various investigations have shown that geodetic spirit levelling data is particularly suitable for quantitative evaluation of recent vertical crustal movements. Providing that a whole network of levelling lines in a region has been observed at least twice, the uplift or subsidence of individual levelling bench marks can be determined. Several analytical techniques have been designed for this purpose (Korhonen 1961; Frost and Lilly 1966; Holdahl 1970; Gale 1970; Vaníček and Hamilton 1972). They all have one common feature: They require that the whole network of connected lines must be systematically reobserved (re-

levelled) to allow one to detect the vertical movements.

There exist very few regions, particularly in Canada, where the network has been systematically relevelled. On the other hand, cases of scattered releveling of individual lines or even some segments of lines are comparatively frequent. These relevelings appear wherever there are new lines added to the existing network as well as wherever the regular maintenance of the networks takes place.

It is the belief of the authors that even these scattered relevelings can yield valuable evidence of vertical movements. This belief prompted the development of a flexible method

that would enable one to extract whatever information on vertical movements there might be in these relevelings.

The presentation of one such method is the aim of this paper. It is evident that if any such method is to be generally acceptable, it should not only allow one to determine the vertical movements from scattered relevelings, but also produce results compatible with the established techniques in regions where the systematic releveling is available. Thus the authors felt compelled to complement the presentation with a comparison between the results of this method and the method currently used by the U.S. National Geodetic Survey (Holdahl 1973). The area selected for comparison is the vicinity of Chesapeake Bay, Md., U.S.A.

Basic Idea of the Method

The basic idea behind the method is fairly simple. It is first assumed that every point (ϕ, λ) moves with a constant velocity $v(\phi, \lambda)$. Then a surface representing the velocities in an area is sought. This surface is determined in such a way as to best fit the observations in the least-squares sense.

Making use of this assumption of constancy, height differences determined by spirit levelings can be converted to velocity differences. The relationship between the velocities v_A, v_B and the heights $h_A(t_1), h_B(t_1), h_A(t_2), h_B(t_2)$ of two adjacent bench marks A and B determined at times t_1, t_2 is

$$[1] \quad v_B - v_A = \Delta v_{AB} \\ = \frac{[h_B(t_2) - h_B(t_1)] - [h_A(t_2) - h_A(t_1)]}{t_2 - t_1}$$

Denoting by $\Delta h_{AB}(t_1)$ the levelled height difference, *i.e.*

$$\Delta h_{AB}(t_1) = h_B(t_1) - h_A(t_1)$$

at the time t_1 , and similarly

$$\Delta h_{AB}(t_2) = h_B(t_2) - h_A(t_2)$$

it is not difficult to see that

$$[2] \quad \Delta v_{AB} = \frac{\Delta h_{AB}(t_2) - \Delta h_{AB}(t_1)}{t_2 - t_1} = \frac{d \Delta h_{AB}}{dt}$$

Since the height differences obtained from the

two levelings are known and so is the time interval dt , the difference of vertical velocities of the two relevelled adjacent bench marks can be computed.

The velocity surface v can be expressed by a generalized two-dimensional polynomial

$$[3] \quad v(\phi, \lambda) = \sum_{i=1}^l c_i \psi_i(\phi, \lambda)$$

where ψ_i are some arbitrarily chosen, linearly independent functions of the position (expressed by the coordinates ϕ and λ), and c_i are the best fitting coefficients to the observations. Since only the observations of velocity differences are available one has to rewrite [3] in a more suitable form, namely

$$[4] \quad \Delta v(\phi, \lambda) = \sum_{i=1}^l c_i \Delta \psi_i(\phi, \lambda)$$

where $\Delta \psi_i(\phi, \lambda) = \psi_i(\phi_B, \lambda_B) - \psi_i(\phi_A, \lambda_A)$, for any pair of adjacent bench marks A and B . Substituting the observed velocity differences for Δv 's, the above system of equations can be solved for l coefficients c_i , providing the number of observed velocity differences is equal to or larger than l , using the well known least-squares technique.

Then the velocities v have to be converted to the uplifts. Since one works with the hypothesis that the velocities are constant in time, the uplifts are linear in time. A relative uplift μ of a point (ϕ, λ) in a period ΔT is given by

$$[5] \quad \mu(\phi, \lambda) = \Delta T v(\phi, \lambda)$$

Obviously, the absolute uplifts cannot be determined from the levelling data alone. This hindrance is common to all the techniques dealing with relevelings and is inherent in the type of data used. In mathematical terms, it thus makes no sense to seek the absolute term in the polynomial [3]. More about this will be given later.

Theoretically, the selection of the so-called base functions ψ_i for the generalized polynomial [3] can be purely arbitrary. Practically, the two-dimensional algebraic functions $\phi^i \lambda^j$, $i, j = 0, 1, \dots, m$ would be used in most cases because of their simplicity. The basic equations, known as the observation equations, then become

$$[6] \quad \left(\frac{d\Delta h}{dt} \right)_k + r_k = \sum_{\substack{i,j=0 \\ i+j \neq 0}}^{i,j,m} c_{ij} (\phi_{B_k}^i \lambda_{B_k}^j - \phi_{A_k}^i \lambda_{A_k}^j), \quad k = 1, 2, \dots, n$$

where r_k are the residuals of the observed quantities $(d\Delta h/dt)_k$. The condition $n \geq m(m+2)$, where n is the number of relevelled segments, has to be obviously satisfied.

Determination of the Optimal Coefficients, Statistically Significant Velocity Surface

The Eq. [6] can now be used to derive the optimal coefficients c_{ij} . Denoting the vector of $(d\Delta h/dt)_k$, $k = 1, 2, \dots, n$, by D , the vector of r_k , $k = 1, 2, \dots, n$, by R , the vector of $c_{ij} = c_s$, $s = 1, 2, \dots, l = m(m+2)$, by C and the matrix of

$$\begin{aligned} \phi_{B_k}^i \lambda_{B_k}^j - \phi_{A_k}^i \lambda_{A_k}^j &= \Delta \psi_s(\phi_k, \lambda_k), \\ &k = 1, 2, \dots, n \\ &s = 1, 2, \dots, l \end{aligned}$$

by ΔB , Eq. [6] can be rewritten as

$$[6'] \quad \Delta B C = D + R$$

The system of normal equations obtained using the least-squares technique becomes

$$[7] \quad \Delta B^T W \Delta B C = \Delta B^T W D$$

where W is the weight matrix. It seems reasonable to assume that the individually observed velocity differences are not correlated and to let the W degenerate to a diagonal form. Then the procedure described in (Vaniček and Hamilton 1972) can be used for evaluating the diagonal elements of W . When both matrices ΔB and W and the vector D are determined, the system of normal equations [7] can be solved for the optimal coefficients C .

From the computational point of view it is advantageous to transform the coordinates ϕ , λ of the individual bench marks to rectangular coordinates x , y related to an arbitrary origin located preferably close to the center of the region. Selection of a convenient scale helps to keep the computational errors low.

Not all the computed optimal coefficients may be statistically significant. The variance-covariance matrix

$$[8] \quad \Sigma_c = \frac{R^T W R}{n - l} (\Delta B^T W \Delta B)^{-1}$$

can serve as a tool for testing their statistical significance. Multivariate statistics can be used to select the coefficients that are significant on a certain level of probability. This approach, however, is quite involved and a simpler treatment is desirable. One such technique, the orthogonalization of the basic functions, comes to one's mind immediately.

In the present method, the Gram-Schmidt's orthogonalization (see, for instance Cheney 1966) is first applied to the set of basic functions. The optimal fourier coefficients \tilde{c}_s of the new (orthogonal) base functions can then be computed from a new system of normal equations. The matrix of this new system is, of course, diagonal and so is the associated variance-covariance matrix. Thus each of the fourier coefficients can be tested for statistical significance against its own variance. A certain level of significance, in terms of a multiple of the standard deviation can be assumed, and all the coefficients, insignificant on this level, can be discarded. The significant coefficients are then transformed back, resulting in a vector of significant coefficients c_s^* , $s = 1, 2, \dots, l^* \leq l$. These are generally different from the original c_s , and it can be stated that they define a velocity surface, statistically significant on the assumed level of probability. The level of significance thus controls the smoothness of the velocity surface.

Uplift Prediction

Having once determined the statistically significant velocity surface

$$[9] \quad v^* = \psi^{*T} C^*$$

where ψ^* contains just the first l^* basic functions ψ_i belonging to the significant coefficients C^* , the variance of the predicted uplift velocity v^* for any point in the area can be computed. The variance-covariance matrix of the significant coefficients is

$$[10] \quad \Sigma_{c^*} = \frac{R^{*T} W R^*}{n - l^*} (\Delta B^{*T} W \Delta B^*)^{-1}$$

with R^* denoting

$$[11] \quad R^* = D^* - \Delta B^* C^*$$

TABLE 1. Coefficients of the significant velocity surface in cm/century

Degree of x \ Degree of y	0	1	2	3	4
0	-27.990	-0.700	0.114	0.032	-0.003
1	-3.513	0.438	0.294	-0.004	-0.003
2	-0.018	0.030	-0.015	0.003	0.0004
3	0.044	0.021	-0.008	0	0
4	0	0	0	0	0

Note: $x = (\lambda - \lambda_0)/10'$, $y = (\phi - \phi_0)/10'$ where $\lambda_0 = 76^\circ 15'$, $\phi_0 = 38^\circ 15'$.

Hence the variance of any predicted uplift velocity is given by

$$[12] \quad \sigma_v^{*2} = \psi^{*T} \Sigma_c \psi^*$$

The quantities v^* , and σ_v^{*2} , can then be easily transformed to relative uplift μ^* and its variance σ_μ^{*2} using Eq. [5].

If there are some tidal stations located in the area then these can supply the additional information needed to convert the relative uplifts to absolute. Accepting a common rate of the eustatic water level rise (Hicks 1972) the absolute uplift of the tidal stations can be determined. Comparing these absolute uplifts with the relative uplift predictions for the locations of tidal stations, and taking their variances into account, the most probable difference of the absolute and relative uplifts can be determined together with its variance. The mathematics involved is fairly simple and would not be worth elaborating on here.

It can be also mentioned that the test for correlation between the uplift and the topography, described in (Vaníček and Hamilton 1972) and designed to discover the possible presence of the rod error, can be applied here without any alteration.

Results from Chesapeake Bay

The described method was tested on levelling and tidal data used by Holdahl (1973) in his analysis from Chesapeake Bay, Md., U.S.A. From the given 210 relevelled segments, 29 were discarded upon preliminary inspection. They indicated too high a rate of local subsidence of one of their end bench marks. The remaining 181 disconnected segments, covering most of the area analysed by Holdahl, were used in the analysis with weights equal to those used by Holdahl.

A surface of fourth degree, expressed by

means of 24 coefficients, was then fitted to the observations. Comparison of the fourier coefficients with their standard deviations resulted in the retention of only 4 coefficients larger than one standard deviation, producing only 17 (out of 24) significant coefficients in the original polynomial, plus the absolute term determined from the tidal data (see Table 1). The a posteriori variance factor

$$\sigma_o^* = \sqrt{\frac{R^{*T}WR^*}{181 - 17}}$$

came up to 6.2 (Cristodulidis 1973).

The predicted uplift μ^* computed from the retained polynomial with the absolute term given by tide-gauge readings is plotted in Fig. 1 together with Holdahl's results. The agreement between the two predictions appears to be reasonable with the possible exception of the south-east corner, where Holdahl's analysis includes more data.

The standard deviation of the velocity surface is given in Fig. 2. For comparison, standard deviation of Holdahl's results is also provided. The lack of data in the southeast corner, for the presented solution, shows up clearly in the increased standard deviation. The same holds true for the Atlantic shore where the absence of data is also felt. In the controlled areas, *i.e.* where data are available, the standard deviation is under 10 cm/century almost everywhere. We may notice that outside the controlled region, the standard deviation σ_μ^* increases rapidly. This confirms the known rule that a least-squares surface should not be used for extrapolation.

Finally, Fig. 3 shows how the difference of the two predictions compares with the geometric mean of the two standard deviations. The difference in the controlled region reaches 15 cm/century only in one place on the eastern

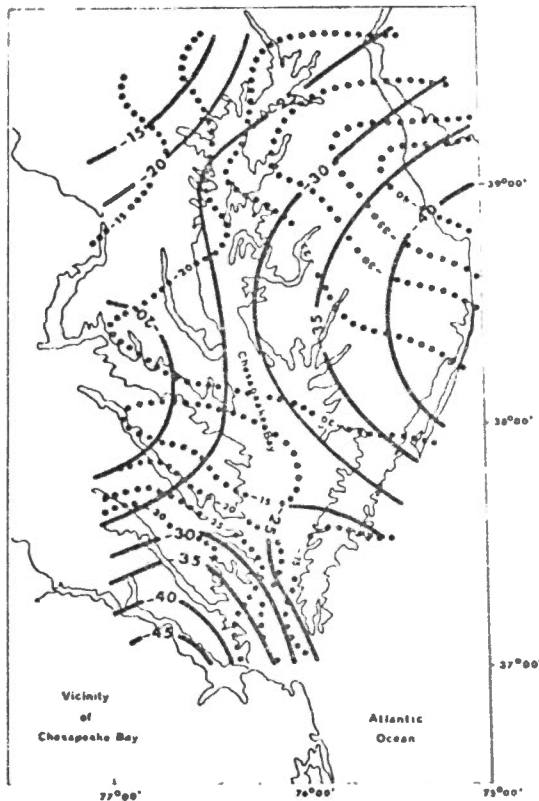


FIG. 1. Legend: ——— Iso-uplift lines as indicated by the presented method; . . . iso-uplift lines according to Holdahl, both in cm/century. Shades depict areas where Holdahl's results indicate faster subsidence.

shore. It is mostly under 10 cm/century elsewhere. The areas where the difference is larger than the mean standard deviation cover less than 25% of the whole region. If one accepts the hypothesis that the difference is a variate with normal distribution, one can conclude that probably the standard deviation is estimated slightly too pessimistically.

For the sake of completeness, it should be stated that the correlation between the computed uplifts and the heights is weak to non-existent.

Conclusions

From the comparison between Holdahl's and the presented results one can see that the difference is statistically insignificant. The presented results vary more smoothly than Holdahl's, yet depicting the basic features noticeable in Holdahl's solution. This smoothness is in the

nature of the technique. The difference in the two solutions can be diminished, if this were for some reason the aim, by lowering the chosen level of significance of the velocity surface. The authors found similar behaviour in earlier tests conducted with the Lac St. Jean data. There, by retaining all the computed coefficients, *i.e.* using the 'zero significance' level of the velocity surface, they were able to practically reproduce the results given by Vaniček and Hamilton (1972).

The estimated standard deviation of the velocity surface is quite compatible with that of Holdahl. It indicates that the presented method is capable of providing as trustworthy results as the usual approach using the adjustment technique.

The authors are hence satisfied that this method is able to match the existing techniques in areas where complete relevellings are available. In addition, its flexibility allowing one to

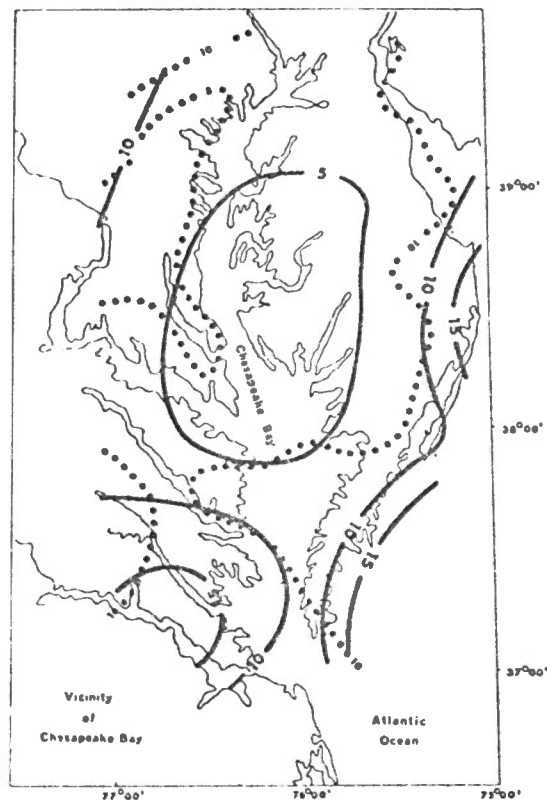


FIG. 2. Legend: ——— Standard deviation of the presented prediction; . . . standard deviation of Holdahl's prediction, both in cm/century. Shaded areas show where Holdahl's deviation is smaller.

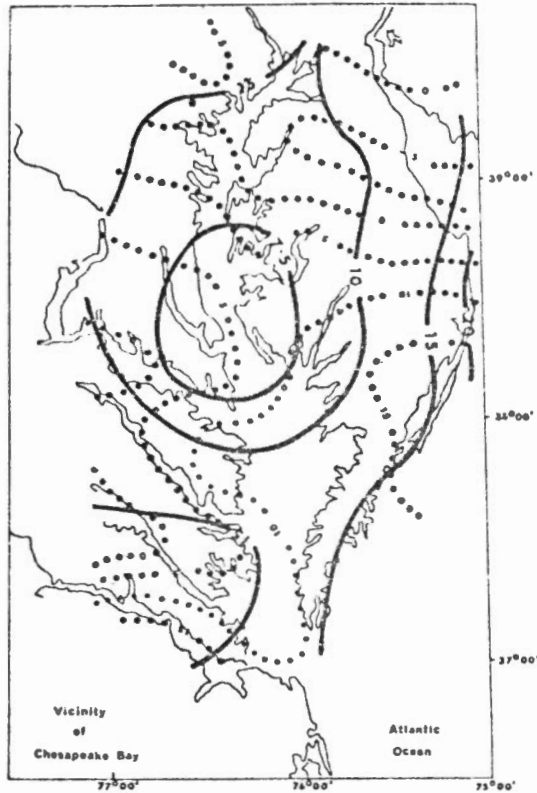


FIG. 3. Legend: ——— Geometric mean of Holdahl's and the presented standard deviations; difference between Holdahl's and presented predictions, both in cm/century. Shaded areas where the difference is above the one standard deviation level.

use isolated relevelled segments provides a very distinct advantage. The only weakness of the method is that the basic functions must be linearly independent. For a particular selected set of functions this requirement may not be satisfied if the relevelled segments are distributed in a certain way. The probability of this happening in practice, however, is very remote. Moreover, such a singularity can

usually be removed by a convenient transformation of coordinates.

Acknowledgments

The authors wish to acknowledge that the method was developed under the sponsorship of the Canadian Department of Energy, Mines and Resources, Surveys and Mapping Branch, expressed in research agreement No. 1135-D13-5-20/73. The authors' gratitude is also due to S. R. Holdahl of the U.S. National Geodetic Survey for the data he had very promptly and willingly supplied as well as for helpful discussions. A. C. Hamilton, the chairman of the Department of Surveying Engineering, University of New Brunswick also made several useful suggestions.

- CHENEY, E. W. 1966. Introduction to approximation theory. McGraw-Hill, New York.
- CHRISTODULIDIS, D. 1973. Determination of vertical crustal movements from scattered relevelings. Unpubl. M.Sc.Eng. thesis, Univ. New Brunswick, Fredericton, New Brunswick.
- FROST, N. and LILLY, J. E. 1966. Crustal movement in the Lac St. Jean area, Quebec. *Can. Surv.* XX(4), pp. 292-299.
- GALE, L. A. 1970. Geodetic observations for the detection of vertical crustal movement. *Can. J. Earth Sci.*, 7, pp. 602-606.
- HICKS, S. D. 1972. Vertical crustal movements from sea-level measurements along the east coast of the United States. 53rd Ann. Meet., Am. Geophys. Un., Washington, D.C.
- HOLDAHL, S. R. 1970. Studies of precise levelling at California fault sites. Fall Meet., Am. Geophys. Un., San Francisco, California.
- HOLDAHL, S. R. 1973. Rates of elevation change in the vicinity of Chesapeake Bay as indicated by precise levelling. 54th Ann. Meet., Am. Geophys. Un., Washington, D.C.
- KORHONEN, J. 1961. Adjustment of levellings in region of slow vertical movement. *Ann. Acad. Sci. Fennicae, Sec. AIII* 61, pp. 127-142.
- VANIČEK, P. and HAMILTON, A. C. 1972. Further analysis of vertical crustal movement observations in the Lac St. Jean area, Quebec. *Can. J. Earth Sci.*, 9, pp. 1139-1147.

(ii) Listing of Computer Program

REQUESTED OPTIONS: OPT=2, NCMAP, NOXREF, NOTERMINAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FLA

ISN 0002	IMPLICIT REAL*8(A-H,O-Z)	00000010
ISN 0003	DIMENSION T1(2000), DHT1(2000), T2(2000), DHT2(2000), AFD(2000), & AFM(2000), ALD(2000), ALM(2000), BFD(2000), BFM(2000), BLD(2000), & BLM(2000), V(2000), IAFD(2000), IALD(2000), IBFD(2000), IBLD(2000), & IFFD(2000), IFLD(2000), DT(2000), D(2000), W(2000)	00000020 00000030 00000040 00000050
ISN 0004	DIMENSION FFD(10), FFM(10), FLD(10), FLM(10), FIX(10), FIXSTD(10), & XF(10), YF(10), SIGMAR(10)	00000060 00000070
ISN 0005	DIMENSION C(36), F(36), SUMC(36), SIGMAC(36,36), XYPP(36), XYS(36), & ALPHA(36)	00000080 00000090
ISN 0006	DIMENSION SIGMAP(1000), PFD(1000), PEM(1000), PLD(1000), & PLM(1000), P(1000), IPFD(1000), IPLD(1000)	00000100 00000110
ISN 0007	INTEGER SUBSGM, SUBCTR	00000114
ISN 0008	INTEGER RECORD(20), SORT(20)	00000115
ISN 0009	REAL FLORED, CEILFD, FLORLD, CEILLD, CONINT	00000116
ISN 0010	REAL VCMIN, VCMAX, STDMIN, STDMAX	00000117
ISN 0011	DIMENSION N(80)	00000120
ISN 0012	COMMON/BLOCK1/M	00000130
ISN 0013	REAL XINCH, YINCH	00000134
ISN 0014	COMMON /EXTREM/ FLORED, CEILFD, FLORLD, CEILLD	00000135
ISN 0015	COMMON /IBOX/ IBOX	00000136
ISN 0016	COMMON /XYINCH/ XINCH, YINCH	00000137
ISN 0017	COMMON /CTRLIM/ VCMIN, VCMAX, STDMIN, STDMAX	00000138

C		00000140
C	*****	*00000150
C	*	*00000160
C	* PROGRAM CRUP	*00000170
C	*	*00000180
C	* PURPOSE	*00000190
C	* COMPUTES A LEAST SQUARES VELOCITY SURFACE FIT TO REPEATED	*00000200
C	* LEVELLING DATA FOR DETECTION OF CRUSTAL MOVEMENTS. THE	*00000210
C	* MOVEMENTS CAN EITHER BE RELATIVE OR ABSOLUTE ATTACHED TO	*00000220
C	* TIDE GAUGES. ALLOWS STATISTICAL TEST FOR THE COEFFICIENTS	*00000230
C	* OF THE SURFACE REQUESTED. PERFORMS CHI-SQUARE TEST FOR	*00000240
C	* NORMALITY OF DISTRIBUTION OF RESIDUALS AND CORRELATION	*00000250
C	* TEST BETWEEN CRUSTAL UPLIFTS AND HEIGHTS OF THE AREA.	*00000260
C	*	*00000270
C	* DESCRIPTION OF PARAMETERS	*00000280
C	* INPUT :	*00000290
C	* 1.IR - READ CODE OF COMPUTER USED	*00000300
C	* 2.IW - WRITE CODE OF COMPUTER USED	*00000310
C	* 5.IDP - DEGREE OF APPROXIMATING POLYNOMIAL	*00000320
C	* 6.INDEX2 - INDEX IN CONNECTION WITH STATISTICAL TEST FOR	*00000330
C	* SIGNIFICANCE OF FOURIER COEFFICIENTS. FOR	*00000340
C	* DETAILS REFER TO SUBROUTINE ORTHO FOR INDEX	*00000350
C	* 7.INDEX3 - IS A FLAG INDICATING WHETHER OR NOT THE INPUT	*00000360
C	* HEIGHT DIFFERENCES ARE IN METERS OR FEET	*00000370
C	* 0 - FOR METERS	*00000380
C	* 1 - FOR FEET	*00000390
C	* 8.INDEX4 - IS A FLAG INDICATING WHETHER OR NOT THE INPUT	*00000400
C	* WEIGHTS WILL BE DIVIDED BY THE DISTANCE BETWEEN	*00000410
C	* THE BENCH MARKS (PM) A AND B OR NOT	*00000420

C *
C *

0 - WILL NOT BE DIVIDED
1 - WILL BE DIVIDED

*00000430
*00000440

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C	*	9.N	- A VECTOR OF LENGTH IDP*(IDP+2) COMPOSED OF	*00000450
C	*		ZEROS AND ONES. IT PERMITS SELECTION OF	*00000460
C	*		SPECIFIC BASIC FUNCTIONS OUT OF THE REQUIRED	*00000470
C	*		POLYNOMIAL OF DEGREE IDP. IF N(I) IS ZERO, IT	*00000480
C	*		MEANS THAT THE I TH BASIC FUNCTION OF THE	*00000490
C	*		POLYNOMIAL WILL BE DISCARDED, IF IT IS ONE	*00000500
C	*		IT WILL NOT BE DISCARDED	*00000510
C	*	10.T1	- YEAR ONE, THE LEVELLING WAS RUN	*00000520
C	*	11.DHT1	- HEIGHT DIF. BETWEEN BM A AND BM B AT T1	*00000530
C	*	12.T2	- YEAR TWO, THE LEVELLING WAS RUN	*00000540
C	*	13.DHT2	- HEIGHT DIF. BETWEEN BM A AND BM B AT T2	*00000550
C	*	14.AFD	- LATITUDE (LAT), DEGREES, OF BM A	*00000560
C	*	15.AFM	- LAT. MINUTES, OF BM A	*00000570
C	*	16.ALD	- LONGITUDE (LCN), DEGREES, OF BM A	*00000580
C	*	17.ALM	- LCN, MINUTES, OF BM A	*00000590
C	*	18.BFD	- LAT. DEG. OF BM B	*00000600
C	*	19.BFM	- LAT. MIN. OF BM B	*00000610
C	*	20.BLD	- LON. DEG. OF BM B	*00000620
C	*	21.BLM	- LON. MIN. OF BM B	*00000630
C	*	22.W	- VECTOR WITH THE WEIGHTS	*00000640
C	*	23.PFD	- LAT. DEG. OF PREDICTION	*00000650
C	*	24.PFA	- LAT. MIN. OF PREDICTION	*00000660
C	*	25.PLD	- LCN. DEG. OF PREDICTION	*00000670
C	*	26.PLM	- LCN. MIN. OF PREDICTION	*00000680
C	*	27.OFD	- LAT. DEG. OF ORIGIN	*00000690
C	*	28.OFA	- LAT. MIN. OF ORIGIN	*00000700
C	*	29.OLD	- LON. DEG. OF ORIGIN	*00000710
C	*	30.OLM	- LON. MIN. OF ORIGIN	*00000720
C	*	31.FFD	- LAT. DEG. OF TIDE GAUGE	*00000730
C	*	32.FFA	- LAT. MIN. OF TIDE GAUGE	*00000740
C	*	33.FLD	- LCN. DEG. OF TIDE GAUGE	*00000750
C	*	34.FLM	- LCN. MIN. OF TIDE GAUGE	*00000760
C	*	35.FIX	- RATE OF MOVEMENT OF TIDE GAUGE IN CM/CENTURY	*00000770
C	*	36.FIXSTD	- STANDARD DEVIATION OF ABOVE RATE IN CM/CENTURY	*00000780
C	*	37.SIGMAR	- VARIANCES OF RELATIVE VELOCITIES OF TIDE-GAUGES	*00000790
C	*	38.XINCH	- ARBITRARY SIZE OF CONTOUR MAP IN THE X DIRECTION	*00000791
C	*	39.YINCH	- ARBITRARY SIZE OF THE CONTOUR MAP IN THE Y	*00000792
C	*		DIRECTION	*00000793
C	*	40.SUBSGM	- FLAG DETERMINING IF THE LINE SEGMENT MAP IS TO	*00000794
C	*		BE PRODUCED. SUBSGM=0 NO MAP; SUBSGM=1 MAP	*00000795
C	*	41.SUBCTR	- FLAG DETERMINING IF THE CONTOUR MAPS OF UPLIFT	*00000796
C	*		AND STANDARD DEVIATION ARE TO BE PRODUCED.	*00000797
C	*		SUBCTR = 0 NO MAP; SUBCTR=1 MAPS	*00000798
C	*	42.FLORFD	- LOWEST PHI DEGREES FOR PREDICTION POINTS	*00000799
C	*	43.FLORFM	- LOWEST PHI MINUTES FOR PREDICTION POINTS	*00000800
C	*	44.CEILFD	- HIGHEST PHI DEGREES FOR PREDICTION POINTS	*00000801
C	*	45.CEILFM	- HIGHEST PHI MINUTES FOR PREDICTION POINTS	*00000802
C	*	46.FLORLD		*00000803
C	*	47.FLORLM		*00000804
C	*	48.CEILLD		*00000805
C	*	49.CEILLM		*00000806
C	*	50.STEP	- THE INCREMENT (IN MINUTES) BETWEEN PREDICTION	*00000807
C	*	51.CUNINT	- THE SPACING BETWEEN CONTOUR LINES	*00000808
C	*	52.SORT	- RECORD - PROVIDE SORT INFORMATION FOR FSORT	*00000809
C	*			*00000810

C * OUTPUT: *00000F11
 C * AFTER THE STATISTICAL TEST FOR FOURIER *C0000B20
 C * COEFFICIENTS IS (NOT) PERFORMED *00000B30

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C	*	2.F	- VECTOR WITH FOURIER COEFFICIENTS	*00000C40			
C	*	3.SUMC	- VECTOR WITH VARIANCES OF FOURIER COEFFICIENTS	*00000B50			
C	*	4.SIGMAF	- VARIANCE FACTOR OF ORTHOGONALIZED POLYNOMIAL	*00000B60			
C	*	5.C	- VECTOR WITH ORIGINAL POLYNOMIAL COEFFICIENTS	*00000B70			
C	*	6.SHIFT	- THE SHIFT OF THE VELOCITY SURFACE AFTER THE TIDE GAUGES READINGS ARE (NOT) INCORPORATED	*00000B80			
C	*			*00000B90			
C	*	7.VARS	- VARIANCE OF THE ABOVE SHIFT	*00000900			
C	*	8.VFAC	- VARIANCE FACTOR OF ORIGINAL POLYNOMIAL	*00000910			
C	*	9.SIGMAC	- VARIANCE COVARIANCE MATRIX OF COEFFICIENTS OF THE ORIGINAL POLYNOMIAL	*00000920			
C	*			*00000930			
C	*	10.D	- OBSERVATION VECTOR	*00000940			
C	*	11.V	- THE RESIDUALS	*00000950			
C	*	12.DT	- TIME SPAN BETWEEN THE TWO LEVELLINGS	*00000960			
C	*	13.X2	- VALUE OF CHI-SQUARE FOR NORMALITY OF DISTRIBUTION OF THE RESIDUALS	*00000970			
C	*			*00000980			
C	*	14.DF	- DEGREES OF FREEDOM FOR CHI-SQUARE TEST	*00000990			
C	*	15.PCHI2	- PROBABILITY (PER CENT) OF NORMALITY OF DISTRIBUTION OF RESIDUALS	*00001000			
C	*			*00001010			
C	*	16.IER	- INDEX IN CONNECTION WITH SUBROUTINE CDFR. REFER TO CDFR FOR FURTHER DETAILS	*00001020			
C	*			*00001030			
C	*	17.PHJ	- CORRELATION COEFFICIENT FROM THE CORRELATION TEST BETWEEN CRUSTAL UPLIFTS AND HEIGHTS OF THE AREA	*00001040			
C	*			*00001050			
C	*	18.RHO2	- RHO SQUARE	*00001060			
C	*			*00001070			
C	*	19.T	- QUANTITY TO BE COMPARED AGAINST STUDENT'S T FOR AN DEGREES OF FREEDOM, FOR TESTING THE HYPOTHESIS : RHO=0	*00001080			
C	*			*00001090			
C	*			*00001100			
C	*	20.AN	- DEGREES OF FREEDOM FOR STUDENT'S TEST	*00001110			
C	*	21.P	- PREDICTIONS IN CM/CENTURY	*00001120			
C	*	22.SIGMAP	- VECTOR WITH VARIANCES OF PREDICTIONS	*00001130			
C	*	23.SPR	- PROBABILITY FOR WHICH THE HYPOTHESIS : RHO = 0, IS ACCEPTED	*00001140			
C	*			*00001150			
C	*	24.IER1	- INDEX IN CONNECTION WITH SUBROUTINE STUDNT. REFER TO STUDNT FOR FURTHER DETAILS	*00001160			
C	*			*00001170			
C	*			*00001180			
C	*			*00001190			
C	*	DATA INPUT			*00001200		
C	*	CARD NUMBER	COLUMNS	VARIABLE	FORMAT	UNITS	
C	*	1	1 - 2	IDP	I2	INTEGER	*00001240
C	*		3 - 4	INDEX2	I2	INTEGER	*00001250
C	*		5 - 6	INDEX3	I2	INTEGER	*00001260
C	*		7 - 8	INDEX4	I2	INTEGER	*00001270
C	*						*00001271
C	*	2	1 - 80	N	I1	INTEGER	*00001272
C	*						*00001273
C	*						*00001280
C	*	3	1 - 5	XINCH	F5.1	INCHES	*00001281
C	*		6 - 10	YINCH	F5.1	INCHES	*00001282
C	*						*00001283
C	*						*00001284
C	*	4	1	SUBSGM	I1	INTEGER	*00001285
C	*		2	SUBCTR	I1	INTEGER	*00001286
C	*		3 - 9	VCMHIN	F7.2	CM/CENTURY	*00001287
C	*		10 - 16	VCMMAX	F7.2	CM/CENTURY	*00001288
C	*		17 - 23	STDMIN	F7.2	CM/CENTURY	*00001289

C	*		24 - 30	STD MAX	F7.2	CM/CENTURY	*C0001290
C	*						*C0001291
C	*	5.....L+5	1 - 6	T1	F6.1	YEARS	*C0001292
C	*		7 - 15	DHT1	F9.4	MT OR FT(SEE INDEX3)	*C0001300

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C	*		16 - 22	T2	F7.1	YEARS	*00001310
C	*		23 - 31	DHT2	F9.4	MT OR FT(SEE INDEX3)	*00001320
C	*		32 - 36	AFD	F5.1	DEGREES	*00001330
C	*		37 - 41	AFM	F5.1	MINUTES	*00001340
C	*		42 - 46	ALD	F5.1	DEG	*00001350
C	*		47 - 51	ALM	F5.1	MIN	*00001360
C	*		52 - 56	BFD	F5.1	DEG	*00001370
C	*		57 - 61	BFM	F5.1	MIN	*00001380

C	*		62 - 66	BLD	F5.1	DEG	*C0001390
C	*		67 - 71	BLM	F5.1	MIN	*C0001400
C	*		72 - 80	W	F9.5	(SEE REMARK #15)	*00001410

C	*						*00001420	
C	*	L+6	BLANK CARD WITH A PERIOD IN COL.5					*00001430
C	*						*00001440	

C	*	L+7	1 - 5	FLOFFD	F5.1	DEGREES	*00001450
C	*		6 - 10	FLOFFM	F5.1	MINUTES	*00001460

C	*		11 - 15	CEILFD	F5.1	DEGREES	*00001470
C	*		16 - 20	CEILFM	F5.1	MINUTES	*00001480
C	*		21 - 25	FLOFLD	F5.1	DEGREES	*00001490
C	*		26 - 30	FLOFLM	F5.1	MINUTES	*00001500
C	*		31 - 35	CEILLD	F5.1	DEGREES	*00001501
C	*		36 - 40	CEILLM	F5.1	MINUTES	*00001502
C	*		41 - 45	STEP	F5.1	MINUTES	*00001503
C	*		46 - 50	CONINT	F5.1	CM/CENTURY	*00001504

C	*	L+8	1 - 80	SORT	20A4	CHARACTER	*00001505
C	*	L+9	1 - 80	RECORD	20A4	CHARACTER	*00001506

C	*	L+10	1 - 10	OFD	F6.2	DEGREES	*00001510
C	*	IPRD+2	1 - 6	OFD	F6.2	DEG	*00001520
C	*		7 - 12	OFM	F6.2	MIN	*00001530
C	*		13 - 18	OLD	F6.2	DEG	*00001540
C	*		19 - 24	DLM	F6.2	MIN	*00001550

C	*	L+11,....,NFI X	1 - 5	FFD	F5.1	DEGREES	*00001560
C	*		6 - 10	FFM	F5.1	MIN	*00001580
C	*		11 - 15	FLD	F5.1	DEG	*00001590
C	*		16 - 20	FLM	F5.1	MIN	*00001600
C	*		21 - 32	FIX	F12.7	CM/CENTURY	*00001610
C	*		33 - 44	FIXSTD	F12.7	CM/CENTURY	*00001620

C	*	NFI X+1	BLANK CARD WITH A PERIOD ON COLUMN 4					*00001630
C	*							*00001640

C	*	REMARKS						*00001650
C	*	1. BLANK CARDS TO END THE DO-LOOPS, ARE REQUIRED AFTER :						*00001660
C	*	THE LAST CARD OF (T1,DHT1,T2,DHT2,...)						*00001670
C	*	THE LAST CARD OF THE REQUIRED PREDICTIONS						*00001680
C	*	THE LAST CARD OF TIDE GAUGES READINGS						*00001690
C	*							*00001700

C	*	2. A TEST IS PERFORMED IN THE PROGRAM FOR THE DEGREES OF						*00001710
C	*	FREEDOM AVAILABLE. IF THEY ARE NEGATIVE OR ZERO THE						*00001720
C	*	PROGRAM WILL GIVE THE APPROPRIATE MESSAGE						*00001730
C	*	3. IF THE STATISTICAL TEST FOR THE FOURIER COEFFICIENTS						*00001740
C	*	IS NOT ABANDONED, IT IS RECOMMENDED THAT THE VECTOR						*00001750

C * N CONSISTS ONLY OF CNES AND LET THE COMPUTER FIND THE *00001760
 C * STATISTICALLY SIGNIFICANT SURFACE. DISCARD BASIC *00001770
 C * FUNCTIONS ONLY IF THE TEST IS ABANDONED AND A *00001780
 C * SPECIAL SURFACE IS REQUIRED *00001790
 C * 4. THE COORDINATES OF THE ORIGINAL POLYNOMIAL ARE GIVEN *00001800

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C * BY THE MODEL : *00001810
 C * XA=(LON OF ORIGIN IN MIN - LON OF A IN MIN)/10 *00001820
 C * YA=(LAT OF A IN MIN - LAT OF ORIGIN IN MIN)/10 *00001830
 C * 5. IF THE DISTANCE BETWEEN TWO RM IS EQUAL TO ZERO DUE TO *00001840
 C * THE LOW PRECISION OF THE LAT AND LON OF THE RM, IT IS *00001850
 C * SET EQUAL TO 100 METERS *00001860
 C * 6. IF ALL OF THE FOURIER COEFFICIENTS ARE DISCARDED AFTER *00001870
 C * THE STATISTICAL TEST IS PERFORMED THE PROGRAM WILL BE *00001880
 C * INTERRUPTED AND A WARNING MESSAGE WILL BE PRINTED *00001890
 C * 7. IF NO TIDE GAUGES READINGS ARE GIVEN THE PREDICTIONS *00001900
 C * WILL BE RELATIVE TO THE ORIGIN *00001910
 C * 8. THE PROGRAM WILL DISCARD ALL BUT THE FIRST TIDE GAUGE *00001920
 C * READING WITH ZERO STANDARD DEVIATION AND THE *00001930
 C * PREDICTIONS WILL BE ATTACHED TO THIS SPECIFIC TIDE *00001940
 C * GAUGE, HOWEVER IF NONE OF THEM HAS ZERO STD. DEV. *00001950
 C * ADJUSTMENT OF THE READINGS WILL TAKE PLACE AND THE *00001960
 C * PREDICTIONS WILL BE ATTACHED TO ALL OF THE TIDE GAUGES *00001970
 C * 9. THE VECTOR OF VARIANCES OF FOURIER COEFFICIENTS SINCE *00001980
 C * IS REPLACED BY THEIR STANDARD DEVIATIONS *00001990
 C * 10. THE VARIANCE OF THE SHIFT, VARS, IS REPLACED BY ITS *00002000
 C * STANDARD DEVIATION *00002010
 C * 11. THE VARIANCE COVARIANCE MATRIX OF THE PREDICTIONS IS *00002020
 C * NOT AVAILABLE FOR STORAGE PURPOSES, SHOULD IT BE *00002030
 C * NEEDED, ALTERNATIONS SHOULD BE MADE *00002040
 C * 12. THE VARIANCES OF THE PREDICTIONS, ARE UPDATED *00002050
 C * BY THEIR STANDARD DEVIATION *00002060
 C * 13. THE PROGRAM REQUIRES FOUR TEMPORARY WORK FILES, THE *00002070
 C * THIRD OF WHICH IS A DIRECT ACCESS ONE. ADDED TO THIS *00002071
 C * ARE THE THREE TEMPORARY SORT FILES. THERE ARE ALSO 3 *00002072
 C * SEMI-PERMANENT FILES WHICH ARE CREATED IN THE CONTOURING *00002073
 C * STEP OF THE PROGRAM AND NEEDED IN THE CAM STEP (WHICH *00002074
 C * MAY BE RUN AS A SEPARATE JOB COMPLETELY). THESE FILES *00002075
 C * ARE USED AS FOLLOWS: *00002076
 C * 1) DATA FOR THE VERTICAL CRUSTAL MOVEMENT CONTOUR MAP *00002077
 C * 2) DATA FOR THE STANDARD DEVIATION OF THE VCM CONTOUR MAP *00002078
 C * 3) DATA FOR THE INPUT SEGMENTS MAP *00002079
 C * THESE MAY BE ELIMINATED WHEN THE PLOTTING IS COMPLETED. *00002080
 C * 14. THE OBJECT CODE OF THE PROGRAM IS APPROXIMATELY 70K *00002090
 C * WITH FORTRAN IV *00002100
 C * 15. THE PROGRAM REQUIRES DOUBLE PRECISION VARIABLES *00002110
 C * 16. UNITS OF WEIGHT VECTOR ARE : $YR^{**2}/((CM^{**2}+CM^{**2})*KM)$, *00002120
 C * OR $YR^{**2}/(CM^{**2}+CM^{**2})$, DEPENDING UPON INDEX4 *00002130
 C * 17. THE CONTOUR MAP MUST BE GIVEN A MATRIX OF VALUES FOR A *00002131
 C * RECTANGULAR REGION AND NO READINGS MAY BE OMITTED. SINCE *00002132
 C * PREDICTIONS IN SOME AREAS OF THE GRID ARE MEANINGLESS *00002133
 C * AND MAY PRODUCE AN EXTREMELY LARGE NUMBER OF CONTOURS, *00002134
 C * A CALL TO THE ENTRY POINT SETLIM OF THE CONTOURING *00002135
 C * PACKAGE ELIMINATES THIS UNNECESSARY PLOTTING. *00002136
 C * 18. THE VALUES TO BE CONTOURED MUST BE GIVEN TO THE CONTOUR *00002137
 C * ROUTINES IN A MATRIX WITH INCREASING X (LONGITUDE POS. *00002138
 C * WEST) ALONG THE ROWS AND INCREASING Y (LATITUDE) DOWN THE *00002139
 C * COLUMNS. THE PREDICTIONS ARE THUS SORTED USING THE U.N. *00002140


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C * COMPUTING CENTRE LIBRARY PROGRAM FTSORT WHICH PROVIDES #C0002141
C * ACCESS TO THE IBM SORT/MERGE UTILITY PROGRAM. #00002142
C * 19. AT U.N.B. THE CALCOMP PLOTTING ROUTINES ARE IMPLEMENTED #00002143
C * IN NAME ONLY. A CALL TO A CALCOMP ROUTINE CALLS AN #00002144
C * INTERFACE PROGRAM WHICH CALLS THE APPROPRIATE PROGRAM #00002145
C * IF THE U.N.B. PLOTTING PACKAGE. ALL OF THE ACTUAL #C0002146

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C * PLOTTING IS DONE THROUGH THE SUBROUTINE PLTRTN.THEREFORE #00002147
C * IN ORDER TO CREATE AN INPUT FILE&FOR THE CARTOGRAPHIC #00002148
C * AUTOMATIC MAPPING PROGRAM(CAM) SO THAT EITHER CONTOUR #00002149
C * LINES OR LINE SEGMENTS MAY COME OUT IN THE SAME PROJEC-#00002150
C * TION AS THE MAP,IT WAS NECESSARY TO WRITE A SUBROUTINE #00002151
C * (PLTRTN) WHICH WOULD TAKE THE IC,IX,AND IY VALUES GIVEN#00002152
C * AND CHANGE THEM INTO DEGREES MINUTES AND SECONDS OF #00002153
C * LATITUDE AND LONGITUDE AND PRODUCE A LINE SEGMENT NUMBE#00002154
C * TO CORRESPOND WITH THESE COORDINATES. IC IS AN INTEGER #00002155
C * *4 VARIABLE REPRESENTING THE CONTROL VARIABLE WHICH #00002156
C * DICTATES THE PLOTTING PEN MOVEMENTS AS FOLLOWS: #00002157
C * 1) NEGATIVE MEANS LIFT THE PLOTTING PENCIL AND POSITION#00002158
C * IT AT THE SPECIFIED POINT LEAVING IT UP. #00002159
C * 2) ZERO MEANS FIRST LIFT THE PLOTTING PENCIL, THEN #00002160
C * POSITION IT AT THE SPECIFIED POINT AND FINALLY PUT THE #00002161
C * PENCIL DOWN,IE.,PLGT THE POINT #00002162
C * 3) POSITIVE EXCEPT 2, MEANS DROP THE PLOTTING PENCIL #00002163
C * DOWN WHEREVER IT WAS AND DRAG IT TO THE SPECIFIED #00002164
C * POINT LEAVING IT IN THE DOWN POSITION. #00002165
C * 4)A VALUE OF 2 MEANS DRAW A STRAIGHT LINE FROM THE #00002166
C * PREVIOUS PLOTTING PENCIL POSITION TO SPECIFIED POINTAND #00002167
C * THEN LIFT THE PLOTTING PENCIL UP. #00002168

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C * SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED: #00002169
C * CRUMOV FCT #00002170
C * HELP MATRIT #00002171
C * SHIFTA DRIVER #00002172
C * ORTHO SEGMNT #00002180
C * PHI PLTRTN #00002190
C * CH12 CONMAP #00002200
C * COTR ISOMAP #00002220
C * DLGAM ISOVAL #00002230
C * NDTR ROW #00002240
C * COR1 ALOGAR #00002250
C * STUDNT CINSPL #00002260

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C * METHOD #00002290
C * THE MODEL AND THE PROGRAM WERE DEVELOPED AT THE UNIVERSITY #00002300
C * OF NEW BRUNSWICK IN 1972-73, FOR A MASTER OF SCIENCE THESIS#00002320
C * BY DEMOSTHENES CRISTODULIDES UNDER THE SUPERVISION OF #00002330
C * DR. P. VANICEK. DETAILED DESCRIPTION OF THE METHGD EXISTS #00002340
C * IN THE ABOVE MENTIONED THESIS. #00002350

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C * ***** #00002360
C * #00002370
C * #00002380
C * #00002390

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C ... DEFINE THE DIRECT ACCESS FILE ... #00002400
C #00002410
C DEFINE FILE 3(2000,200,L,MA) #00002420
C #00002430
C ... SPECIFY READ AND WRITE CODES OF COMPUTER ... #00002440

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ISN 0019	C	IF=5	00002450
ISN 0020		IBOX = 0	00002460
ISN 0021		IW=6	00002461
	C		00002470
	C	... READS IDP,INDEX2,INDEX3,INDEX4 ...	00002480
	C		00002490
	C		00002500

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ISN 0022		READ(IR,1) IDP,INDEX2,INDEX3,INDEX4	00002510
ISN 0023	1	FORMAT(4I2)	00002520
	C		00002530
	C	... IT COMPUTES LENGTH OF N AND READS N ...	00002540
	C		00002550

ISN 0024		MIM=IDP*(IDP+2)	00002560
ISN 0025		READ(IR,5) (N(I),I=1,MIM)	00002570
ISN 0026	5	FORMAT(80I1)	00002580
ISN 0027		READ(IR,4327) XINCH,YINCH	00002581
ISN 0028	4327	FORMAT(2F5.1)	00002582
ISN 0029		READ(IR,4328) SUBSGM,SUBCTR,VCMMIN,VCMMAX,STDMIN,STDMAX	00002583
ISN 0030	4328	FORMAT(2I1,4F7.2)	00002584
ISN 0031		MC=MIM	00002590

	C		00002600
	C	... COMPUTES M = NUMBER OF SELECTED FUNCTIONS ...	00002610
	C		00002620

ISN 0032		M=0	00002630
ISN 0033		DO 10 I=1,MIM	00002640
ISN 0034		IF(N(I).EQ.1) M=M+1	00002650
ISN 0036	10	CONTINUE	00002660

	C		00002670
	C	... READS INPUT DATA AND COMPUTES L = NUMBER OF OBSERVATIONS ...	00002680
	C		00002690

ISN 0037		L=0	00002700
ISN 0038		DO 50 I=1,4000	00002710
ISN 0039		READ(IR,40) T1(I),DHT1(I),T2(I),DHT2(I),AFD(I),AFM(I),ALD(I),ALM(I),BFD(I),BFM(I),BLD(I),BLM(I),W(I)	00002720
ISN 0040	40	FORMAT(F6.1,F9.4,F7.1,F9.4,8F5.1,F9.5)	00002730
ISN 0041		IF(T1(I).EQ.0.) GO TO 55	00002740
ISN 0043		L=L+1	00002750
ISN 0044	50	CONTINUE	00002760
ISN 0045	55	CONTINUE	00002770
ISN 0046		IF(SUBSGM.EQ.1) CALL SEGMENT(AFD,AFM,ALD,ALM,BFD,BFM,BLD,BLM,L)	00002780

	C		00002781
	C	... READS INPUT DATA FOR PREDICTION ...	00002790
	C		00002800
	C		00002810

ISN 0048		IPRD=0	00002820
ISN 0049		READ(IR,224) FLORFD,FLORFM,CEILFD,CEILFM,FLORLD,FLORLM,CEILLD,CEILLM,CM,STEP,CCNINT	00002851
ISN 0050	224	FORMAT(10F5.1)	00002852
ISN 0051		PLD(1) = FLORFD	00002853
ISN 0052		PLM(1) = FLORFM	00002854
ISN 0053		PLD(1) = FLORLD	00002855
ISN 0054		PLM(1) = FLORLM	00002856
ISN 0055		DO 14 I = 2,4000	00002857
ISN 0056		PLM(I) = PLM(I-1) + STEP	00002858
ISN 0057		IF(PLM(I).GE.60.) GO TO 11	00002860
ISN 0059		PLD(I) = PLD(I-1)	00002861
ISN 0060		IF((PLD(I).GT.CEILLD).OR.((PLD(I).EQ.CEILLD).AND.(PLM(I).GT.CEILLM))) GO TO 12	00002862
			00002863
			00002864

ISN 0062		PFD(I) = PFD(I-1)	00002866
ISN 0063		PFM(I) = PFM(I-1)	00002867
ISN 0064		GO TO 14	00002869
ISN 0065	11	FLM(I) = FLM(I) - 60.	00002871
ISN 0066		FLD(I) = PLD(I-1) +1.	00002872
ISN 0067		IF((PLD(I).GT.CEILLD).OR.((PLD(I).EQ.CEILLD).AND.(PLM(I).GT.CEIL	00002873
		CLLM))) GO TO 12	00002874
ISN 0069		FFD(I) = PFD(I-1)	00002875

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ISN 0070		PFM(I) = PFM(I-1)	00002877
ISN 0071		GO TO 14	00002879
ISN 0072	12	IF((PFD(I-1).EQ.CEILFD).AND.(PFM(I-1).EQ.CEILFM)) GO TO 16	00002890
ISN 0074		PLD(I) = FLOPLD	00002892
ISN 0075		PLM(I) = FLOPLM	00002893
ISN 0076		PFM(I) = PFM(I-1)+ STEP	00002894
ISN 0077		IF(PFM(I).GE.60.) GO TO 13	00002895
ISN 0079		FFD(I) = PFD(I-1)	00002897
ISN 0080		GO TO 14	00002900
ISN 0081	13	PFM(I) = PFM(I) -60.	00002902
ISN 0082		PFD(I) = PFD(I-1) +1.	00002903
ISN 0083		GO TO 14	00002905
ISN 0084	14	CONTINUE	00002907
ISN 0085	16	IPRD = I-1	00002908
ISN 0086		FLOPLD = FLOPLD + (FLOPLM/60.)	00002909
ISN 0087		CEILLD = CEILLD + (CEILLW/60.)	00002910
ISN 0088		FLOPLD = FLOPLD + (FLOPLM/60.)	00002911
ISN 0089		CEILFD = CEILFD + (CEILFM/60.)	00002912
ISN 0090		READ(IR,100) SORT	00002913
ISN 0091	100	FORMAT(20A4)	00002915
ISN 0092		READ(IR,100) RECORD	00002917
ISN 0093	C	READ(IR,310) OFD,OFM,OLD,OLM	00002930
ISN 0094	310	FORMAT(4F5.1)	00002940
ISN 0095	C	OF=(OFD*60D0)+OFM	00002950
ISN 0096		OL=(OLD*60D0)+OLM	00002960
	C		00002970
	C	READS TIDE GAUGE POSITION, READING, STD. DEV OF READING.	00002980
	C		00002990
	C	** THIS IS THE LAST READ STATEMENT OF THE PROGRAM **	00003000
	C		00003010
	C		00003020
ISN 0097		NFIX=0	00003030
ISN 0098		WRITE(6,3)	00003040
ISN 0099	3	FORMAT(' TIDE GAUGE POSITIONS')	00003050
ISN 0100		DO 400 I=1,4000	00003060
ISN 0101		READ(IR,300) FFD(I),PFM(I),FLD(I),FLM(I),FIX(I),FIXSTD(I)	00003070
ISN 0102	300	FORMAT(4F5.1,2F12.7)	00003080
ISN 0103		IF(FFD(I).EQ.0.) GO TO 410	00003090
ISN 0105		NFIX=NFIX+1	00003100
ISN 0106		WRITE(6,2)I,NFIX,FFD(I),PFM(I),FLD(I),FLM(I),FIX(I),FIXSTD(I)	00003110
ISN 0107	2	FORMAT(2I6,4F6.1,2F12.7)	00003120
ISN 0108	400	CONTINUE	00003130
	C		00003140
	C	... COMPUTES 0.5(NFIX*NFIX-NFIX) ADDITIONAL	00003150
	C	... SEGMENTS AS TIDE-GAUGE CONSTRAINTS	00003160
ISN 0109	410	FAC=6.25C0	00003170
ISN 0110		Q=D COS(2.909D-4*OF)	00003180
ISN 0111		DO 51 I=1,NFIX	00003190
			00003200

ISN 0112	DC 52 J=1,NFIX	00003210
ISN 0113	IF(J. LE. I) GC TO 52	00003220
ISN 0115	L=L+1	00003230
ISN 0116	T1(L)=1900.0	00003240
ISN 0117	DHT1(L)=0.0	00003250
ISN 0118	T2(L)=1910.0	00003260
ISN 0119	DHT2(L)=(FIX(J)-FIX(I))/305	00003270
ISN 0120	AFD(I)=FFD(I)	00003280
ISN 0121	AFM(L)=FFM(I)	00003290

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ISN 0122	ALD(L)=FLD(I)	00003300
ISN 0123	ALM(L)=FLM(I)	00003310
ISN 0124	BFD(L)=FFD(J)	00003320
ISN 0125	BFM(L)=FFM(J)	00003330
ISN 0126	BLD(L)=FLD(J)	00003340
ISN 0127	BLM(L)=FLM(J)	00003350
ISN 0128	A=60*(AFD(L)-BFD(L))+AFM(L)-BFM(L)	00003360
ISN 0129	B=60*(ALD(L)-BLD(L))+ALM(L)-BLM(L)	00003370
ISN 0130	S=A*A+Q*Q*B*B	00003380
ISN 0131	W(L)=37064D-2*DSQRT(S)/FAC	00003390
ISN 0132	W(L)=W(L)/(FIXSTD(I)**2+FIXSTD(J)**2)	00003400

ISN 0133	52	CONTINUE	00003410
ISN 0134	51	CONTINUE	00003420

C
C ... SET COORDINATES OF ORIGIN ...
C
C ... TESTS FOR DEGREES OF FREEDOM ...
C

ISN 0135	IDF=L-M	00003480	
ISN 0136	IF(IDF) 15,20,25	00003490	
ISN 0137	15	WRITE(IW,30) IDF	00003500
ISN 0138	30	FORMAT(1H ,37HNEGATIVE DEGREES OF FREEDOM EQUAL TO ,16)	00003510
ISN 0139		GO TO 999	00003520
ISN 0140	20	WRITE(IW,35)	00003530
ISN 0141	35	FORMAT(1H ,23HZERO DEGREES OF FREEDOM)	00003540
ISN 0142		GO TO 999	00003550
ISN 0143	25	CONTINUE	00003560

C

ISN 0144	DC 681 I=1,L	00003580	
ISN 0145	IAFD(I)=AFD(I)	00003590	
ISN 0146	IALD(I)=ALD(I)	00003600	
ISN 0147	IBFD(I)=BFD(I)	00003610	
ISN 0148	IBLD(I)=BLD(I)	00003620	
ISN 0149	681	CONTINUE	00003630
ISN 0150	DD 682 I=1,I PRD	00003640	

ISN 0151	IPFD(I)=PFD(I)	00003650	
ISN 0152	IPLD(I)=PLD(I)	00003660	
ISN 0153	682	CONTINUE	00003670
ISN 0154		WRITE(IW,590)	00003680
ISN 0155	590	FORMAT(1H1)	00003690
ISN 0156		WRITE(IW,600)	00003700
ISN 0157	600	FORMAT(27X,'** APPROXIMATION PARAMETERS *00003710	
		&' , // // //)	00003720

ISN 0158	WRITE(IW,610) IDP	00003730	
ISN 0159	610	FORMAT(10X,'1. DEGREE OF GENERALIZED COMBINED ALGEBRAIC POLYNOMIAL	00003740
		& REQUIRED : ',I2, //)	00003750
ISN 0160		WRITE(IW,620) M	00003760
ISN 0161	620	FORMAT(10X,'2. NUMBER OF COEFFICIENTS REQUIRED : ',I3, //)	00003770

ISN 0162		WRITE(IW,630) (N(I),I=1,MIM)	00003780
ISN 0163	630	FORMAT(10X,'3. SELECTED FUNCTIONS : ',80I1)	00003790
ISN 0164		WRITE(IW,631)	00003800
ISN 0165	631	FORMAT(/)	00003810
	C		00003820
ISN 0166		CALL CRUMOV(L, IPRD,N,MIM,IDP,GF,OL,INDEX2,INDEX3,INDEX4,T1,DHT1,00003830 IT2,DHT2,AFD,AFM,ALD,ALM,BFD,BFM,PLD,BLM,PFM,PLD,PLM,W,NPC,F,SUC0003840 2MC,SIGMAF,C,VFAC,SIGMAC,D,V,DT,X2,DF,PCHI2,IEP,FHQ,RHQ2,T,AN,P,SIG00003850 3MAP,XYPR,XYS,ALPHA,MC,IW,SPF,IER1)	00003860 00003870
	C		

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	C	... CHECKS WHETHER ALL FOURIER COEFFICIENTS ARE DISCARDED ...	00003880
	C		00003890
ISN 0167		IF(NPC.GT.0) GO TO 299	00003900
ISN 0169		WRITE(IW,298)	00003910
ISN 0170	298	FORMAT(10X,'* WARNING * ALL FOURIER COEFFICIENTS DISCARDED. TRY AGC &AIN WITH LOWER LEVEL OF PROBABILITY!')	00003920 00003930
ISN 0171		GO TO 999	00003940
ISN 0172	299	CONTINUE	00003950
	C		00003960
	C	... COMPUTES SHIFT OF THE VELOCITY SURFACE ...	00003970
ISN 0173		IF(NFIX.EQ.0) GO TO 430	00003980
ISN 0175		DO 420 I=1,NFIX	00003990
ISN 0176		XF(I)=(OL-(((FLD(I)*60D0)+FLM(I)))/10D0	00004000
ISN 0177		YF(I)=(((FFD(I)*60D0)+FFM(I))-DE)/10D0	00004010
ISN 0178	420	CONTINUE	00004020
ISN 0179		CALL SHIFTA(N,MC,IDP,C,XF,YF,FX,NFIX,FXSTD,SHIFT,VARS,INDEX1,MI &M,T1,XYPR,SIGMAC,SIGMAR)	00004030 00004040
ISN 0180		IF(INDEX1.EQ.0) GO TO 320	00004050
ISN 0182		ITFD=FFD(INDEX1)	00004060
ISN 0183		ITLD=FLD(INDEX1)	00004070
ISN 0184		WRITE(IW,640)ITFD,FFM(INDEX1),ITLD,FLM(INDEX1),FIX(INDEX1),FIXSTD(&INDEX1)	00004080 00004090
ISN 0185	640	FORMAT(10X,'4. VELOCITIES TAKEN ABSOLUTE BASED ON THE TIDE GAUGE', &//,20X,'PHI :',I4,1X,F5.2,' , ',LAMD :',I4,1X,F5.2,' , ',RATE 0 &F MOVEMENT : ',F8.3,' + ',F8.3)	00004100 00004110 00004120
ISN 0186		WRITE(IW,641)	00004130
ISN 0187	641	FORMAT(1H+,86X,'_')	00004140
ISN 0188		GO TO 440	00004150
ISN 0189	320	DO 330 I=1,NFIX	00004160
ISN 0190		IFFD(I)=FFD(I)	00004170
ISN 0191		IFLD(I)=FLD(I)	00004180
ISN 0192	330	CONTINUE	00004190
ISN 0193		WRITE(IW,650)	00004200
ISN 0194	650	FORMAT(10X,'4. VELOCITIES TAKEN ABSOLUTE BASED ON TIDE GAUGES', &//,17X,'P H I',6X,'L A M D A',4X,'R A T E',3X,'STD.DEV.',//)	00004210 00004220
ISN 0195		WRITE(IW,660)(I,IFFD(I),FFM(I),IFLD(I),FLM(I),FIX(I),FIXSTD(I),I=1 &,NFIX)	00004230 00004240
ISN 0196	660	FORMAT(11X,I2,' , ',I3,2X,F5.2,2X,I3,2X,F5.2,3X,F8.3,2X,F8.3)	00004250
ISN 0197		GO TO 440	00004260
ISN 0198	430	SHIFT=ODC	00004270
ISN 0199		VARS=ODD	00004280
ISN 0200		IOFD=OFD	00004290
ISN 0201		IOLD=OLD	00004300
ISN 0202		WRITE(IW,670) IOFD,OFM,IOLD,OLM	00004310
ISN 0203	670	FORMAT(10X,'4. VELOCITIES TAKEN RELATIVE TO THE POINT , PHI :',I4, &1X,F5.2,' , ',LAMD :',I4,1X,F5.2)	00004320 00004330
ISN 0204	440	CONTINUE	00004340

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0205
SN 0206      680  WRITE(IW,680) INDEX2
              FORMAT(//,10X,'5. INPUT LEVEL OF PROBABILITY GIVEN IN MULTIPLES OF
              & THE STD. DEV. OF THE FOURIER COEF. :',I3,/)
              C
              C ... PREDICTIONS UPDATED BY COMPUTED SHIFT ...
              C
ISN 0207      DO 305 I=1,IPRD
ISN 0208      P(I)=P(I)+SHIFT
ISN 0209      305  CONTINUE
              C
              C ... VARIANCES OF PREDICTIONS UPDATED BY VARIANCE OF SHIFT ...

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              C
ISN 0210      DO 777 I=1,IPRD
ISN 0211      SIGMAP(I)=SIGMAP(I)+VARS
              C
              C ... THE FINAL VECTOR OF VARIANCES DE PREDICTIONS
              C              C              C              C
              C              C              C              C
              C              C              C              C
              C              C              C              C
ISN 0212      SIGMAP(I)=DSQRT(SIGMAP(I))
ISN 0213      777  CONTINUE
              C
              C ... VARIANCES OF FOURIER COEFFICIENTS UPDATED BY STD. DEV. ...
              C
ISN 0214      DO 683 I=1,M
ISN 0215      SUMC(I)=DSQRT(SUMC(I))
ISN 0216      683  CONTINUE
              C
              C ... VARIANCE OF SHIFT UPDATED BY STD. DEV. ...
              C
ISN 0217      VARS=DSQRT(VARS)
              C
              C ... PRINTS REST OF RESULTS ...
              C
ISN 0218      WRITE(IW,690) NPC
ISN 0219      690  FORMAT(10X,'6. NUMBER OF COEF. OF THE ORIGINAL POLYNOMIAL AFTER TH
              & STATISTICAL TEST IS (NOT) PERFORMED :',I4,/)
ISN 0220      WRITE(IW,691)
ISN 0221      691  FORMAT(10X,'7. PARAMETERS OF ORTHOGONALIZED POLYNOMIAL',///,16X,'F
              & FOURIER COEFFICIENTS',8X,'STANDARD DEVIATION',/)
ISN 0222      WRITE(IW,692) (I,F(I),SUMC(I),I=1,M)
ISN 0223      692  FORMAT(18X,I2,'. ',D12.5,13X,D12.5)
ISN 0224      WRITE(IW,693) SIGMAF
ISN 0225      693  FORMAT(//,25X,'VARIANCE FACTOR : ',D12.5,/)
ISN 0226      WRITE(IW,694)
ISN 0227      694  FORMAT(10X,'8. PARAMETERS OF ORIGINAL POLYNOMIAL',///,21X,'COEFFIC
              & IENTS',/)
ISN 0228      WRITE(IW,695) (I,C(I),I=1,M)
ISN 0229      695  FORMAT(18X,I2,'. ',D12.5)
ISN 0230      WRITE(IW,696) SHIFT,VARS
ISN 0231      696  FORMAT(//,21X,'COEFFICIENT C00 (SHIFT) : ',D12.5,' + ',D12.5)
ISN 0232      WRITE(IW,6965)
ISN 0233      6965 FORMAT(1H+,60X,'.',/,/)
ISN 0234      WRITE(IW,697) VFAC
ISN 0235      697  FORMAT(21X,'VARIANCE FACTOR : ',D12.5,/)
ISN 0236      WRITE(IW,698)
ISN 0237      698  FORMAT(1H1)
ISN 0238      WRITE(IW,699)

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ISN 0239	699	FORMAT(32X,'VARIANCE COVARIANCE MATRIX OF COEFFICIENTS',//)	00004920
ISN 0240		I=0	00004930
ISN 0241		CALL MATFIT(SIGMAC, MC,55,1,I,IW)	00004940
ISN 0242		WRITE(IW,700)	00004950
ISN 0243	700	FORMAT(1H1)	00004960
ISN 0244		WRITE(IW,701)	00004970
ISN 0245	701	FORMAT(41X,'** S T A T I S T I C S **',/////)	00004980
ISN 0246		WRITE(IW,702)	00004990
ISN 0247	702	FORMAT(10X,'CBSEPR',4X,'CBSEPR',7X,'RESIDUAL',5X,'TIME',4X,'PHI A' &,4X,'LAMDA A',4X,'PHI B',4X,'LAMDA B',3X,'WEIGHT',/,10X,'NUMBER',400005000 &X,'VECTOR',20X,'SPAN',//)	00005020
ISN 0248		WRITE(IW,703)(I,D(I),V(I),DT(I),IAFD(I),AFM(I),IALD(I),ALM(I),IBFDC	00005030

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ISN 0249	703	&(I),BFM(I),IBLD(I),HLM(I),W(I),I=1,L) FORMAT(11X,I3,3X,D12.5,2X,D12.5,2X,F6.2,2X,I2,1X,F5.2,2X,I2,1X,F5. &2,2X,I2,1X,F5.2,2X,I2,1X,F5.2,2X,F6.3)	00005040 00005050 00005060
ISN 0250		WRITE(IW,704)	00005070
ISN 0251	704	FORMAT(///,10X,'RESULTS FROM THE CHI SQUARE TEST FOR NORMALITY OF &DISTRIBUTION OF THE RESIDUALS',//)	00005080 00005090
ISN 0252		WRITE(IW,705) X2	00005100
ISN 0253	705	FORMAT(31X,'CHI SQUARE : ',F12.5,//)	00005110
ISN 0254		WRITE(IW,706) DF	00005120
ISN 0255	706	FORMAT(23X,'DEGREES OF FREEDOM : ', F5.2,//)	00005130
ISN 0256		WRITE(IW,707) PCHI2	00005140
ISN 0257	707	FORMAT(16X,'PROBABILITY FOR NORMALITY : ',F7.4,2X,'PER CENT',//)	00005150
ISN 0258		WRITE(IW,708) IER	00005160
ISN 0259	708	FORMAT(16X,'ERROR INDEX IN CONNECTION',/,17X,'WITH SUBROUTINE *CDT' &R* : ',I2,//)	00005170 00005180
ISN 0260		WRITE(IW,709)	00005190
ISN 0261	709	FORMAT(10X,'RESULTS FROM CORRELATION TEST BETWEEN UPLIFTS AND HEIGHTS &HTS OF THE AREA',//)	00005200 00005210
ISN 0262		WRITE(IW,710) RHO	00005220
ISN 0263	710	FORMAT(12X,'CORRELATION COEFFICIENT (RHO) : ',F7.5,//)	00005230
ISN 0264		WRITE(IW,711) RHO2	00005240
ISN 0265	711	FORMAT(31X,'RHO SQUARE : ',F7.5,//)	00005250
ISN 0266		WRITE(IW,712) T,AN,SPR,IER1	00005260
ISN 0267	712	FORMAT(27X,'TEST FOR THE HYPOTHESIS : RHO=0',/,21X,'QUANTITY T= &',F9.5,/, ' BY COMPARING IT AGAINST',/,21X,'STUDENTS T FOR ',F6.2,/ & DEGREES OF FREEDOM, WE',/,21X,'GET PROBABILITY FOR ACCEPTING THE & NULL HYPOTHESIS EQUAL TO ',F8.4, ' PER CENT',/,21X,'E &ROR INDEX IN CONNECTION WITH SUBROUTINE *STUDENT* : ',I3,/,21X,'(00005310 &NOTE THAT FOR DEGREES OF FREEDOM GREATER THAN 110',/,21X,'THE QUANT &NTITY T IS COMPARED AGAINST THE NORMAL DISTRIBUTION)',//)	00005270 00005280 00005290 00005300 00005310 00005320
ISN 0268		WRITE(IW,713)	00005330
ISN 0269	713	FORMAT(1H1)	00005340 00005350
ISN 0270		WRITE(IW,714)	00005360
ISN 0271	714	FORMAT(35X,'** P R E D I C T I O N S **',/////)	00005370
ISN 0272		WRITE(IW,715)	00005380
ISN 0273	715	FORMAT(10X,'PREDICTION',3X,'LOAD C A T I O N',3X,'COMPUTED UPLIFT', &2X,'STANDARD DEVIATION',/,12X,'NUMBER',4X,'PHI',3X,'L A M D A',/ &/)	00005390 00005400 00005410
ISN 0274		WRITE(IW,716)(I,IPFD(I),PFM(I),IPLD(I),PLM(I),P(I),SIGMAP(I),I=1 &,IPRD)	00005420 00005430
ISN 0275	716	FORMAT(13X,I3,5X,I2,1X,F5.2,2X,I2,1X,F5.2,3X,D12.5,7X,D12.5)	00005440
ISN 0276		IF(SUBCTR.EQ.1) CALL DRIVER(IPFD,PFM,IPLD,PLM,P,SIGMAP,IPRD, SORT, & FECOND,STEP,CONINT)	00005445 00005445
ISN 0278		WRITE(IW,717)	00005450
ISN 0279	717	FORMAT(1H1)	00005460

ISN 0280	999	CONTINUE	00005470
ISN 0281		STOP	00005480
ISN 0282		END	00005490

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTIONS IN EFFECT*SOURCE EBCDIC NCLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FL

STATISTICS SOURCE STATEMENTS = 281, PROGRAM SIZE = 382446, SUBPROGRAM NAME = MAIN

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILATION *****

40K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

OS/360 FORTRAN H EXTENDED

DATE 76.364/11.16.33

REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMINAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NCLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FL

ISN 0002	SUBROUTINE CRUMOV(L, IPPD,N,MIM,IPD,OF,OL,INDEX2,INDEX3,INDEX4,T100005500	
	1,DHT1,T2,DHT2,AFD,AFM,ALD,ALM,BFD,BFM,BLD,BLM,PDF,PFM,PLC,PLM,W,NP00005510	
	2C,F,SUMC,SIGMAF,C,VFAC,SIGMAC,D,V,DT,X2,DF,PCHI2,IER,PHO,RHO2,T,AN00005520	
	3,P,SIGMAP,XYPR,XYS,ALPHA,MC,IW,SFR,IER1)	00005530

C		00005540
C	*****	00005550
C	* SUBROUTINE CRUMOV	*00005560
C	* THIS SUBROUTINE IS PART OF THE MAIN PROGRAM AND IT IS	*00005570
C	* USED ONLY FOR REAL TIME DIMENSIONING REASONS	*00005580
C	*	*00005590

C	*****	00005600
C		00005610

ISN 0003	IMPLICIT REAL*8(A-H,O-Z)	00005620
ISN 0004	COMMON/BLOCK1/M	00005630
ISN 0005	DIMENSION T1(L),DHT1(L),T2(L),DHT2(L),AFD(L),AFM(L),ALD(L),ALM(L),	00005640
	1BFD(L),BFM(L),BLD(L),BLM(L),PDF(IPRD),PFM(IPRD),PLC(IPRD),PLM(IPRD),	00005650
	2),W(L),F(M),SUMC(M),C(M),SIGMAC(MC,M),D(L),V(L),DT(L),P(IPPD),SIGM	00005660
	3AP(IPRD),XYPR(M),XYS(M),ALPHA(MC,M),N(MIM)	00005670

C		00005680
C	... COMPUTES OBSERVATION VECTOR D (UNITS ARE CM PER CENTURY)...	00005690
C		00005700

ISN 0006	IF(INDEX3.EQ.0) GO TO 57	00005710
ISN 0008	DO 56 I=1,L	00005720
ISN 0009	DHT1(I)=DHT1(I)*0.3048D0	00005730
ISN 0010	DHT2(I)=DHT2(I)*0.3048D0	00005740

ISN 0011	56 CONTINUE	00005750
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ISN 0012	57 CCNTINUE	00005760
ISN 0013	DO 45 I=1,L	00005770
ISN 0014	DT(I)=T2(I)-T1(I)	00005780
ISN 0015	D(I)=DHT2(I)-DHT1(I)	00005790
ISN 0016	D(I)=D(I)*10000D0	00005800
ISN 0017	D(I)=D(I)/DT(I)	00005810
ISN 0018	T1(I)=(DHT1(I)+DHT2(I))/2D0	00005820
ISN 0019	45 CONTINUE	00005830

ISN 0020	DC 100 I=1,L	00005840
ISN 0021	ALD(I)=(CL-((ALD(I)*60D0)+ALM(I)))/10D0	00005850
ISN 0022	AFD(I)=(((AFD(I)*60D0)+AFM(I))-CF)/10D0	00005860
ISN 0023	BLD(I)=(CL-((BLD(I)*60D0)+BLM(I)))/10D0	00005870
ISN 0024	BFD(I)=(((BFD(I)*60D0)+BFM(I))-CF)/10D0	00005880

ISN 0025	100	CCONTINUE	00005890
ISN 0026		DC 105 I=1,IPRD	00005900
ISN 0027		PLD(I)=(DL-((PLD(I)*6000)+PLM(I)))/1000	00005910
ISN 0028		PFD(I)=(((PFD(I)*6000)+PFM(I))-OF)/1000	00005920
ISN 0029	105	CCONTINUE	00005930
	C		00005940
	C	... FORMS WEIGHT VECTOR ...	00005950
	C		00005960
ISN 0030		IF(INDEX4.EQ.0) GO TO 111	00005970
ISN 0032		FAC=6.2500	00005980
	C		00005990
	C	... FAC IS THE RATIO BETWEEN ACTUAL AND INPUT STANDARDISED WEIGHTS	00006000
	C	KM PER MM SQUARED) TIMES 100.	00006010
	C		00006020

LEVEL 2.1 (JAN 75) CRUMOV OS/360 FORTRAN H EXTENDED DATE 76.364/11.16.33

ISN 0033		Q=DCOS(2.909D-4*OF)	00006030
ISN 0034		DC 110 I=1,L	00006040
ISN 0035		A=Q*(BLD(I)-ALD(I))	00006050
ISN 0036		B=BFD(I)-AFD(I)	00006060
ISN 0037		S=18.532D0*DSQRT(A*A+B*B)	00006070
ISN 0038		IF(S.EQ.0D0) S = 0.1D0	00006080
ISN 0040		W(I)=W(I)*FAC*DT(I)*DT(I)*0.5D-4/S	00006090
ISN 0041	110	CCONTINUE	00006100
ISN 0042	111	CCONTINUE	00006110
	C		00006120
	C	... FORMS DESIGN MATRIX B OF THE MODEL AND MATRIX XYPR FOR	00006130
	C	THE PREDICTIONS (XYPR*C=P) ...	00006140
	C		00006150
ISN 0043		CALL HELP(L,N,IPRD,IDP, MIM, XYPR,ALD,AFD,BLD,BFD,PLD,PFD)	00006160
	C		00006170
	C	... COMPUTATIONS FOR THE LEAST SQUARES SOLUTION	00006180
	C	OF THE MODEL B*C=D ...	00006190
	C		00006200
ISN 0044		CALL ORTHO(L, 1D0, MC,SIGMAF,VFAC,NPC,INDEX2,V,SIGMAC,D,W,C,ALP	00006210
		&HA, F,SUMC,DHT2,DHT1,IW)	00006220
	C		00006230
	C	... IF ALL FOURIER COEFFICIENTS DISCARDED RETURN ...	00006240
	C		00006250
ISN 0045		IF(NPC.GT.0) GO TO 244	00006260
ISN 0047		RETURN	00006270
ISN 0048	244	CCONTINUE	00006280
	C		00006290
	C	... COMPUTES PREDICTED VALUES OF UPLIFT ...	00006300
	C		00006310
ISN 0049		REWIND 1	00006320
ISN 0050		DO 245K=1,IPRD	00006330
ISN 0051		READ (1)XYPR	00006340
ISN 0052		P(K)=0.00	00006350
ISN 0053		SIGMAP(K)=0.00	00006360
ISN 0054		DO 245J=1,M	00006370
ISN 0055		P(K)=P(K)+XYPR(J)	00006380
	X	*C(J)	00006390
ISN 0056		XYR(J)=0.00	00006400
ISN 0057		DO 230I=1,M	00006410
ISN 0058		XYR(J)=XYR(J)+XYP	00006420
	X	R(I)*SIGMAC(I,J)	00006430
ISN 0059	230	CCONTINUE	00006440
ISN 0060		SIGMAP(K)=SIGMAP(00006450

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      X K, +XYS(J) *XYPR(J)
ISN 0061 245 CONTINUE
      C
      C ... CHI SQUARE TEST FOR NORMALITY OF DISTRIBUTION OF RESIDUALS ...
      C
ISN 0062 CALL CHI2(L,X2,DF,PCHI2,DENS,IER,V,DHT1)
      C
      C ... CORRELATION TEST BETWEEN UPLIFTS AND HEIGHTS OF THE AREA ...
      C
ISN 0063 DO 510 I=1,L
ISN 0064 T2(I)=D(I)-V(I)
ISN 0065 510 CCNTINUE
ISN 0066 CALL COR1(L,RHO,RHO2,T,AN,T2,I1,W,SPR,IER1)
      C
ISN 0067 RETURN

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LEVEL 2.1 ( JAN 75 ) CRUMOV OS/360 FORTRAN H EXTENDED DATE 76.364/11.16.33
ISN 0068 END 00006610
OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FLA
STATISTICS* SOURCE STATEMENTS = 67, PROGRAM SIZE = 3444, SUBPROGRAM NAME =CRUMOV
STATISTICS* NO DIAGNOSTICS GENERATED
***** END OF COMPILEATION ***** 88K BYTES OF CORE NOT USED

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LEVEL 2.1 ( JAN 75 ) OS/360 FORTRAN H EXTENDED DATE 76.364/11.16.47
REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMINAL
PTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FLA
ISN 0002 SUBROUTINE SHIFTA(N,MC,IDP,C,XF,YF,FX,NFIX,FXSTD,SHIFT,VARS,INDEX)
      C
      C &X1. MIM,WS,XYFIX,SIGMAC,SIGMAR)
      C *****
      C *
      C * SUBROUTINE SHIFTA
      C * THIS SUBROUTINE WAS DESIGNED TO INCORPORATE TIDE GAUGES
      C * READINGS TO THE COMPUTED CRUSTAL UPLIFTS. IT RETURNS ONE
      C * VALUE FOR SHIFT AND ITS VARIANCE VARS.
      C *****
      C *
      C *****
      C
ISN 0003 IMPLICIT REAL*8(A-H,C-Z)
ISN 0004 COMMON/BLOCK1/MM
ISN 0005 DIMENSION N(MIM),C(MM),XF(NFIX),YF(NFIX),FX(NFIX),FXSTD(NFIX),
      C &XYFIX(MM),WS(NFIX),SIGMAC(MC,MM),SIGMAR(NFIX)
ISN 0006 INDEX1=0
ISN 0007 DO 80 I=1,NFIX
ISN 0008 IF(FIXSTD(I).EQ.0D0) GO TO 81
ISN 0010 80 CONTINUE
ISN 0011 GO TO 82
ISN 0012 81 INDEX1=I

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ISN 0013	82	CCONTINUE	00006840
ISN 0014		IN=IDP+1	00006850
ISN 0015		DC 21 I=1,NFIX	00006860
ISN 0016		M=0	00006870
ISN 0017		L=0	00006880
ISN 0018		DC 20 J=1,IN	00006890
ISN 0019		DC 20 K=1,IN	00006900
ISN 0020		IF(J.EQ.1,AND,K.EQ.1) GO TO 10	00006910
ISN 0022		IF(N(L).EQ.0) GO TO 10	00006920
ISN 0024		M=M+1	00006930
ISN 0025		IF(J-1.EQ.0) GO TO 30	00006940
ISN 0027		IF(K-1.EQ.0) GO TO 40	00006950
ISN 0029		IF(I.LE.NFIX) XYFIX(M)=XF(I)**(J-1)*YF(I)**(K-1)	00006960
ISN 0031		GC TO 10	00006970
ISN 0032	30	IF(I.LE.NFIX) XYFIX(M)=YF(I)**(K-1)	00006980
ISN 0034		GC TO 10	00006990
ISN 0035	40	IF(I.LE.NFIX) XYFIX(M)=XF(I)**(J-1)	00007000
ISN 0037	10	L=L+1	00007010
ISN 0038	20	CONTINUE	00007020
ISN 0039		XF(I)=0D0	00007030
ISN 0040		SIGMAR(I)=0D0	00007040
ISN 0041		DC 50 J=1,MM	00007050
ISN 0042		XF(I)=XF(I)+XYFIX(J)*C(J)	00007060
ISN 0043		SIGMAR(I)=SIGMAR(I)+XYFIX(J)*XYFIX(J)*SIGMAC(J,J)	00007070
ISN 0044	50	CONTINUE	00007080
ISN 0045	21	CONTINUE	00007090
ISN 0046		DC 60 K=1,NFIX	00007100
ISN 0047		YF(K)=FIX(K)-XF(K)	00007110
ISN 0048	60	CONTINUE	00007120
ISN 0049		IF(INDEX1.EQ.0) GO TO 90	00007130
ISN 0051		SHIFT=YF(INDEX1)	00007140

LEVEL 2.1 (JAN 75)

SHIFTA

DS/360 FORTRAN H EXTENDED

DATE 76.364/11.16.47

ISN 0052		VARS=SIGMAR(INDEX1)	00007150
ISN 0053		GO TO 100	00007160
ISN 0054	90	CCONTINUE	00007170
ISN 0055		SUMWS=0D0	00007180
ISN 0056		TEMPS=0D0	00007190
ISN 0057		TVARS=0D0	00007200
ISN 0058		AFIX=DFLOAT(NFIX)	00007210
ISN 0059		DC 70 K=1,NFIX	00007220
ISN 0060		WS(K)=1D0/((FIXSTD(K)**2)+SIGMAR(K))	00007230
ISN 0061		TEMPS=TEMPS+YF(K)*WS(K)	00007240
ISN 0062		SUMWS=SUMWS+WS(K)	00007250
ISN 0063	70	CONTINUE	00007260
ISN 0064		SHIFT=TEMPS/SUMWS	00007270
ISN 0065		IF(NFIX.GT.1) GO TO 5	00007280
ISN 0067		VARS=FIXSTD(1)*FIXSTD(1)	00007290
ISN 0068		RETURN	00007300
ISN 0069	5	DC 200 K=1,NFIX	00007310
ISN 0070		TVARS=TVARS+(YF(K)-SHIFT)*(YF(K)-SHIFT)*WS(K)	00007320
ISN 0071	200	CONTINUE	00007330
ISN 0072		VARS=TVARS/((AFIX-1D0)*SUMWS)	00007340
ISN 0073	100	RETURN	00007350
ISN 0074		END	00007360

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTIONS IN EFFECT*SOURCE EBCDIC NCLIST NODECK OBJECT NOMAP NOFORMAT GUSTMT NOXREF ALC NOANSF NOTERMIAL FI

STATISTICS SOURCE STATEMENTS = 73, PROGRAM SIZE = 1894, SUBPROGRAM NAME =SHIFTA
 STATISTICS NO DIAGNOSTICS GENERATED
 ***** END OF COMPILATION ***** 96K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75) OS/360 FORTRAN H EXTENDED DATE 76.364/11.16.54

REQUESTED OPTIONS: OPT=2,NOMAP,NCXREF,NOTERMINAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
 SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NJTERMINAL FL

ISN 0002	SUBROUTINE ORTHO(N, SIGMA, MFD,SIGMAF,VFC,NPC,INDEX,V,SUMD,F,W)0007370	
	C,D,ALPHA, C,SUMC,SC2,STDP,IW)0007380	
	C THIS SUBROUTINE ORTHOGONALIZES THE MATRIX PHI USING THE GRAM-SCHMIDT 00007390	
	C METHOD, COMPUTES THE FOURIER COEFFICIENTS OF THE ORTHOGONALIZED MATRIX 00007400	
	C DERIVES THE COEFFICIENTS OF PHI, COMPUTES THE VARIANCES OF THE FOURIER 00007410	
	C COEFFICIENTS AND THE VARIANCE-COVARIANCE MATRIX OF THE COEFFICIENTS 00007420	
	C INPUTS : 00007430	
	C 1. PHI(OPTIONAL - COULD BE FUNCTION SUBPROGRAM INSTEAD) - AN N BY M 00007440	
	C CONTAINING THE BASE FUNCTIONS EVALUATED FOR EACH OBSERVATION 00007450	
	C 2. N - THE NUMBER OF OBSERVATIONS 00007460	
	C 3. M - THE NUMBER OF BASE FUNCTIONS (EQUAL OR GREATER THAN 2) 00007470	
	C 4. W - A VECTOR OF LENGTH N CONTAINING THE COMPUTED WEIGHT FUNCTIONS 00007480	
	C 5. F - FUNCTIONAL VALUES 00007490	
	C 6. SIGMA - THE A PRIORI VARIANCE FACTOR 00007500	
	C 7. MRD - THE MAXIMUM ROW DIMENSION OF PHI 00007510	
	C 8. MRC - THE MAXIMUM COLUMN DIMENSION OF PHI 00007520	
	C 9. INDEX - PERMITS OPTIONAL TEST FOR STATISTICAL SIGNIFICANCE 00007530	
	C OF FOURIER COEFFICIENTS.... 00007540	
	C IF 0, STATISTICAL TEST FOR FOURIER COEFFICIENTS ABANDONED 00007550	
	C IF 1, TESTS AGAINST ONE TIME ITS STANDARD DEVIATION 00007560	
	C IF 2, TESTS AGAINST TWICE ITS ST. DEVIATION 00007570	
	C IF 3, TESTS AGAINST THREE TIMES ITS ST. DEVIATION 00007580	
	C 10. IW - WRITE CODE OF THE COMPUTER 00007590	
	C OUTPUTS : 00007600	
	C 1. ALPHA - AN MRD BY M MATRIX CONTAINING THE ALPHA'S USED IN COMPUTING 00007610	
	C THE ORTHOGONALIZED MATRIX AND IN COMPUTING THE COEFFICIENTS OF PHI 00007620	
	C 2. C - THE M FOURIER COEFFICIENTS OF THE ORTHOGONALIZED MATRIX 00007630	
	C 3. D - THE M COEFFICIENTS OF THE INPUT MATRIX PHI 00007640	
	C 4. SUMC - THE VARIANCES OF THE FOURIER COEFFICIENTS 00007650	
	C 5. SUMD - THE VARIANCE-COVARIANCE MATRIX OF THE COEFFICIENTS 00007660	
	C 6. SC2 - THE SQUARES OF THE NORMS OF THE ORTHOGONALIZED MATRIX 00007670	
	C 7. SIGMAF - THE FOURIER POLYNOMIAL A POSTERIORI VARIANCE FACTOR 00007680	
	C 8. V - THE N RESIDUALS 00007690	
	C 9. VFC - THE ORIGINAL POLYNOMIAL A POSTERIORI VARIANCE FACTOR 00007700	
	C 10. NPC - NUMBER OF THE COEFFICIENTS OF THE ORIGINAL POLYNOMIAL 00007710	
	C AFTER THE STATISTICAL TEST IS PERFORMED 00007720	
	C 11. STDP - VECTOR AGAINST WHICH THE ABSOLUTE VALUES OF FOURIER 00007730	
	C COEFFICIENTS ARE TESTED 00007740	
ISN 0003	IMPLICIT REAL*8(A-H,O-Z) 00007750	
ISN 0004	COMMON/BLOCK1/M 00007760	
ISN 0005	DIMENSION ALPHA(MPD,M),W(N),F(N),C(M),D(M) 00007770	
ISN 0006	DIMENSION SUMD(MRD,M),SUMC(M),SC2(M),V(N) 00007780	
ISN 0007	DIMENSION STDP(M),PHI(36) 00007790	
	C TEST FOR NEGATIVE DEGREES OF FREEDOM 00007800	
ISN 0008	IF (N.LT.M) GO TO 100 00007810	
ISN 0010	K=1 00007820	
ISN 0011	ALPHA(M,M)=1.D0 00007830	

	C DETERMINE THE ALPHA'S FOR COMPUTATION OF ORTHOGONALIZED MATRIX	C0007840
ISN 0012	10 DC 3 J=K,M	C0007850
ISN 0013	IF(J.NE.K) GO TO 6	C0007860
ISN 0015	ALPHA(K,K)=1.00	C0007870
ISN 0016	GC TO 3	C0007880
ISN 0017	6 SC1=0.00	C0007890

LEVEL 2.1	(JAN 75)	ORTHO	OS/360 FORTRAN H EXTENDED	DATE 76.364/11.16.59
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ISN 0018	SC2(K)=0.00	00007900
ISN 0019	SC3=0.00	00007910
ISN 0020	DC 2 I=1,N	00007920
ISN 0021	READ(3'I)PHI	00007930
ISN 0022	P=PHI(K)	00007940
ISN 0023	IF(K.EQ.1) GO TO 4	00007950
ISN 0025	K1=K-1	00007960
ISN 0026	DC 5 J1=1,K1	00007970
ISN 0027	5 P=P+ALPHA(J1,K)*PHI(J1)	00007980
ISN 0028	4 SC1=SC1+W(I)*PHI(J)*P	00007990
ISN 0029	SC3=SC3+F(I)*W(I)*P	00008000
ISN 0030	2 SC2(K)=SC2(K)+W(I)*P**2	00008010
ISN 0031	ALPHA(J,K)=-SC1/SC2(K)	00008020
ISN 0032	ALPHA(K,J)=ALPHA(J,K)	00008030
ISN 0033	3 CONTINUE	00008040
	C DETERMINE THE FOURIER COEFFICIENTS FOR THE ORTHOGONALIZED MATRIX	00008050
ISN 0034	C(K)=SC3/SC2(K)	00008060
ISN 0035	K=K+1	00008070
ISN 0036	IF(M.EQ.2) GO TO 34	00008080
ISN 0038	IF(K.LT.3) GO TO 10	00008090
	C DETERMINE THE ALPHA'S USED IN COMPUTING THE COEFFICIENTS OF PHI	00008100
ISN 0040	JK=K-1	00008110
ISN 0041	9 JL=K	00008120
ISN 0042	JK=JK-1	00008130
ISN 0043	JJ=K-JK-1	00008140
ISN 0044	DC 8 LM=1,JJ	00008150
ISN 0045	JL=JL-1	00008160
ISN 0046	8 ALPHA(JK,K)=ALPHA(JK,K)+ALPHA(JK,JL)*ALPHA(K,JL)	00008170
ISN 0047	IF(JK.NE.1) GO TO 9	00008180
ISN 0049	IF(K.LT.M) GO TO 10	00008190
	C DETERMINE THE LAST FOURIER COEFFICIENT	00008200
ISN 0051	34 SC2(K)=0.00	00008210
ISN 0052	SC3=0.00	00008220
ISN 0053	DC 7 I=1,N	00008230
ISN 0054	READ(3'I)PHI	00008240
ISN 0055	P=PHI(K)	00008250
ISN 0056	K1=K-1	00008260
ISN 0057	DC 1 J=1,K1	00008270
ISN 0058	1 P=P+ALPHA(J,K)*PHI(J)	00008280
ISN 0059	SC2(K)=SC2(K)+W(I)*P**2	00008290
ISN 0060	7 SC3=SC3+F(I)*W(I)*P	00008300
ISN 0061	C(K)=SC3/SC2(K)	00008310
	C DETERMINE THE COEFFICIENTS OF PHI	00008320
ISN 0062	IDEKT=1	00008330
ISN 0063	ICOUNT=0	00008340
ISN 0064	1000 CONTINUE	00008350
ISN 0065	DC 13 I=1,M	00008360
ISN 0066	D(I)=C(I)	00008370
ISN 0067	IF(I.EQ.M) GO TO 13	00008380
ISN 0069	II=I+1	00008390
ISN 0070	DC 14 J=II,M	00008400

ISN 0071	14	D(I)=D(I)+ALPHA(I,J)*C(J)	00008410
ISN 0072	13	CONTINUE	00008420
		C COMPUTE THE VARIANCE OF THE FOURIER COEFFICIENTS AND THE VARIANCE-COVA	00008430
		C MATRIX OF THE COEFFICIENTS	00008440
ISN 0073	DC 15	I=1,M	00008450
ISN 0074	DC 15	J=1,M	00008460
ISN 0075	15	SUMD(I,J)=0.00	00008470

LEVEL 2.1 (JAN 75) ORTHO OS/360 FORTRAN M EXTENDED DATE 76.364/11.16.59

ISN 0076		SC4=0.00	00008480
ISN 0077	DC 22	I=1,N	00008490
ISN 0078		READ(3,'I')PHI	00008500
ISN 0079		PN=C.00	00008510
ISN 0080	DC 21	J=1,M	00008520
ISN 0081	21	PN=PN+D(J)*PHI(J)	00008530
ISN 0082		V(I)=F(I)-PN	00008540
ISN 0083		V2=V(I)**2	00008550
ISN 0084	22	SC4=SC4+V2*W(I)	00008560
ISN 0085		SIGMAF=SC4/(N-M+ICOUNT)*SIGMA	00008570
ISN 0086		VFC=SIGMAF	00008580
ISN 0087		IF(IDEKT.EQ.2) VFC=SC4/(N-NPC)*SIGMA	00008590
ISN 0088		IF(INDEX.EQ.0) NPC=M	00008600
ISN 0091	DC 28	I=1,M	00008610
ISN 0092		SUMC(I)=SIGMAF/SC2(I)	00008620
ISN 0093		IF(IDEKT.FO.1) GO TO 28	00008630
ISN 0095		IF(C(I).EQ.000) SUMC(I)=000	00008640
ISN 0097	28	CONTINUE	00008650
ISN 0098	DC 23	I=1,M	00008660
ISN 0099	DC 23	J=1,I	00008670
ISN 0100	DC 23	K=J,I	00008680
ISN 0101	23	SUMD(J,K)=SUMD(J,K)+ALPHA(J,I)*ALPHA(K,I)*SUMC(I)	00008690
ISN 0102	DC 24	I=1,M	00008700
ISN 0103		IT=I+1	00008710
ISN 0104		IF(IT.GI.M) GO TO 30	00008720
ISN 0106	DC 24	J=IT,M	00008730
ISN 0107	24	SUMD(J,I)=SUMD(I,J)	00008740
ISN 0108		C OPTIONAL CHECK FOR STATISTICALLY SIGNIFICANT FOURIER COEFFICIENTS	00008750
ISN 0109	30	CONTINUE	00008760
ISN 0111		IF(INDEX.EQ.0) GO TO 40	00008770
ISN 0113		IF(IDEKT.EQ.2) GO TO 40	00008780
ISN 0114		PINDEX=DFLOAT(INDEX)	00008790
ISN 0115	DC 31	I=1,M	00008800
ISN 0116		STDP(I)=PINDEX*DSQRT(SUMC(I))	00008810
ISN 0118		IF(DABS(C(I)).LT.STDP(I)) GO TO 32	00008820
ISN 0119	32	C(I)=000	00008830
ISN 0120		ICOUNT=ICOUNT+1	00008840
ISN 0121		SUMC(I)=000	00008850
ISN 0122	31	CONTINUE	00008860
ISN 0123		NPC=0	00008870
ISN 0124	DC 33	I=1,M	00008880
ISN 0125		IF(C(I).NE.000) NPC=I	00008890
ISN 0127	33	CONTINUE	00008900
ISN 0128		IDEKT=2	00008910
ISN 0129		GO TO 1000	00008920
ISN 0130	40	RETURN	00008930
ISN 0131	100	WRITE(1W,102)	00008940
ISN 0132	102	FORMAT('0','*ERROP* NEGATIVE DEGREES OF FREEDOM')	00008950
ISN 0133		RETURN	00008960

	C DETERMINE THE ALPHA'S FOR COMPUTATION OF ORTHOGONALIZED MATRIX	C0007840
ISN 0012	10 DC 3 J=K,M	C0007850
ISN 0013	IF(J.NE.K) GO TO 6	C0007860
ISN 0015	ALPHA(K,K)=1.00	C0007870
ISN 0016	GC TO 3	C0007880
ISN 0017	6 SC1=0.00	C0007890

LEVEL 2.1	(JAN 75)	ORTHO	OS/360 FORTRAN H EXTENDED	DATE 76.364/11.16.59
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ISN 0018	SC2(K)=0.00	00007900
ISN 0019	SC3=0.00	00007910
ISN 0020	DC 2 I=1,N	00007920
ISN 0021	READ(3'I)PHI	00007930
ISN 0022	P=PHI(K)	00007940
ISN 0023	IF(K.EQ.1) GO TO 4	00007950
ISN 0025	K1=K-1	00007960
ISN 0026	DC 5 J1=1,K1	00007970
ISN 0027	5 P=P+ALPHA(J1,K)*PHI(J1)	00007980
ISN 0028	4 SC1=SC1+*(I)*PHI(J)*P	00007990
ISN 0029	SC3=SC3+F(I)*W(I)*P	00008000
ISN 0030	2 SC2(K)=SC2(K)+W(I)*P**2	00008010
ISN 0031	ALPHA(J,K)=-SC1/SC2(K)	00008020
ISN 0032	ALPHA(K,J)=ALPHA(J,K)	00008030
ISN 0033	3 CONTINUE	00008040
	C DETERMINE THE FOURIER COEFFICIENTS FOR THE ORTHOGONALIZED MATRIX	00008050
ISN 0034	C(K)=SC3/SC2(K)	00008060
ISN 0035	K=K+1	00008070
ISN 0036	IF(M.EQ.2) GO TO 34	00008080
ISN 0038	IF(K.LT.3) GO TO 10	00008090
	C DETERMINE THE ALPHA'S USED IN COMPUTING THE COEFFICIENTS OF PHI	00008100
ISN 0040	JK=K-1	00008110
ISN 0041	9 JL=K	00008120
ISN 0042	JK=JK-1	00008130
ISN 0043	JJ=K-JK-1	00008140
ISN 0044	DC 8 LM=1,JJ	00008150
ISN 0045	JL=JL-1	00008160
ISN 0046	8 ALPHA(JK,K)=ALPHA(JK,K)+ALPHA(JK,JL)*ALPHA(K,JL)	00008170
ISN 0047	IF(JK.NE.1) GO TO 9	00008180
ISN 0049	IF(K.LT.M) GO TO 10	00008190
	C DETERMINE THE LAST FOURIER COEFFICIENT	00008200
ISN 0051	34 SC2(K)=0.00	00008210
ISN 0052	SC3=0.00	00008220
ISN 0053	DC 7 I=1,N	00008230
ISN 0054	READ(3'I)PHI	00008240
ISN 0055	P=PHI(K)	00008250
ISN 0056	K1=K-1	00008260
ISN 0057	DC 1 J=1,K1	00008270
ISN 0058	1 P=P+ALPHA(J,K)*PHI(J)	00008280
ISN 0059	SC2(K)=SC2(K)+W(I)*P**2	00008290
ISN 0060	7 SC3=SC3+F(I)*W(I)*P	00008300
ISN 0061	C(K)=SC3/SC2(K)	00008310
	C DETERMINE THE COEFFICIENTS OF PHI	00008320
ISN 0062	IDEXT=1	00008330
ISN 0063	ICOUNT=0	00008340
ISN 0064	1000 CONTINUE	00008350
ISN 0065	DC 13 I=1,M	00008360
ISN 0066	D(I)=C(I)	00008370
ISN 0067	IF(I.EQ.M) GO TO 13	00008380
ISN 0069	II=I+1	00008390
ISN 0070	DC 14 J=II,M	00008400

ISN 0134

END

C000848C

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FL

STATISTICS SOURCE STATEMENTS = 133, PROGRAM SIZE = 3992, SUBPROGRAM NAME = OFTHC

STATISTICS NO DIAGNOSTICS GENERATED

LEVEL 2.1 (JAN 75)

OFTHC

OS/360 FORTRAN H EXTENDED

DATE 76.364/11.16.59

***** END OF COMPILATION *****

80K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

CS/360 FORTRAN H EXTENDED

DATE 76.364/11.17.14

REQUESTED OPTIONS: OPT=2,NOMAP,NOXREF,NOTERMIAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE) SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FL

ISN 0002 SUBROUTINE HELP(L,N,IPRD,IDP, MIM, XYPR,XA,YA,XB,YB,XP,YP) 00008990

```

C
C *****
C *
C * SUBROUTINE HELP.
C *
C * THIS SUBROUTINE COMPUTES THE DESIGN MATRIX B FOR THE LEAST
C * SQUARES SOLUTION AND THE MATRIX XYPR FOR THE PREDICTIONS.
C * MODELS USED ARE :
C *
C * B*C=D
C * XYPR*C=P
C *
C *****
C

```

ISN 0003 IMPLICIT REAL*8(A-H,O-Z) 00009120

ISN 0004 COMMON/BLOCK1/MM 00009130

ISN 0005 DIMENSION XA(L),YA(L),XB(L),YB(L),N(MIM) 00009140

ISN 0006 DIMENSION XP(IPRD),YP(IPRD),XYPR(MM),B(36) 00009150

ISN 0007 IN=IDP+1 00009160

ISN 0008 LLOW=L 00009170

ISN 0009 LHIGH=IPRD 00009180

ISN 0010 IF (IPRD.GT.L)GOTO7 00009190

ISN 0012 LLOW=IPRD 00009200

ISN 0013 LHIGH=L 00009210

ISN 0014 7 DO 3I=1,LLOW 00009220

ISN 0015 M=0 00009230

ISN 0016 LL=0 00009240

ISN 0017 DO 2J=1,IN 00009250

ISN 0018 DO 1K=1,IN 00009260

ISN 0019 IF (J.EQ.1)GOTO5 00009270

ISN 0021 IF (K.EQ.1)GOTO6 00009280

ISN 0023 IF(N(LL).EQ.0)GO TO 4 00009290

ISN 0025 M=M+1 00009300

ISN 0026 B(M)=XB(I)**(J-1) 00009310

X *YB(I)**(K-1)-XA(00009320

X I)**(J-1)*YA(I)** 00009330

X (K-1) 00009340

ISN 0027 XYPR(M)=XP(I)**(J 00009350

ISN 0026	X	-1)*YP(I)**(K-1)	00009370
ISN 0029		GO TO 4	00009380
ISN 0031	5	IF (K.EQ.1)GOTO4	00009390
ISN 0032		M=M+1	00009400
		B(M)=YB(I)**(K-1)	00009410
ISN 0033	X	-YA(I)**(K-1)	00009420
		XYPF(M)=YP(I)**(K	00009430
	X	-1)	00009440
ISN 0034		GO TO 4	00009450
ISN 0035	6	M=M+1	00009460
ISN 0036		B(M)=XB(I)**(J-1)	00009470
	X	-XA(I)**(J-1)	00009480
ISN 0037		XYPF(M)=XP(I)**(J	00009490
	X	-1)	00009500
ISN 0038	4	LL=LL+1	00009510

LEVEL 2.1 (JAN 75) HELP OS/360 FORTRAN H EXTENDED DATE 76.3/4/11.17.14

ISN 0039	1	CONTINUE	00009520
ISN 0040	2	CONTINUE	00009530
ISN 0041		WRITE (3'I)B	00009540
ISN 0042		WRITE (1)XYPF	00009550
ISN 0043	3	CONTINUE	00009560
ISN 0044		LLOW=LLOW+1	00009570
ISN 0045		IF (IPRD-L)8,9,10	00009580
ISN 0046	8	DO13I=LLOW,LHIGH	00009590
ISN 0047		M=0	00009600
ISN 0048		LL=0	00009610
ISN 0049		DO 12J=1,IN	00009620
ISN 0050		DO 11K=1,IN	00009630
ISN 0051		IF (J.EQ.1)GOTO15	00009640
ISN 0053		IF (K.EQ.1)GOTO16	00009650
ISN 0055		IF(N(LL).EQ.0)GO TO 14	00009660
ISN 0057		M=M+1	00009670
ISN 0058		B(M)=XB(I)**(J-1)	00009680
	X	*YB(I)**(K-1)-XA(00009690
	X	I)**(J-1)*YA(I)**	00009700
	X	(K-1)	00009710
ISN 0059		GO TO 14	00009720
ISN 0060	15	IF (K.EQ.1)GOTO14	00009730
ISN 0062		M=M+1	00009740
ISN 0063		B(M)=YB(I)**(K-1)	00009750
	X	-YA(I)**(K-1)	00009760
ISN 0064		GO TO 14	00009770
ISN 0065	16	M=M+1	00009780
ISN 0066		B(M)=XB(I)**(J-1)-XA(I)**(J-1)	00009790
ISN 0067	14	LL=LL+1	00009800
ISN 0068	11	CONTINUE	00009810
ISN 0069	12	CONTINUE	00009820
ISN 0070		WRITE (3'I)B	00009830
ISN 0071	13	CONTINUE	00009840
ISN 0072		GO TO 9	00009850
ISN 0073	10	DO23I=LLOW,LHIGH	00009860
ISN 0074		M=0	00009870
ISN 0075		LL=0	00009880
ISN 0076		DO 22J=1,IN	00009890
ISN 0077		DO 21K=1,IN	00009900
ISN 0078		IF (J.EQ.1)GOTO25	00009910
ISN 0080		IF (K.EQ.1)GOTO26	00009920
ISN 0082		IF(N(LL).EQ.0)GO TO 24	00009930

```

ISN C084      M=M+1
ISN C085      XYPR(M)=XP(I)**(J
              X -1)*YP(I)**(K-1)
ISN C086      GO TO 24
ISN C087      25 IF (K.EQ.1)GOTC24
ISN C088      M=M+1
ISN C090      XYPR(M)=YP(I)**(K
              X -1)
ISN C091      GO TO 24
ISN 0092      26 M=M+1
ISN 0093      XYPR(M)=XP(I)**(J
              X -1)
ISN 0094      24 LL=LL+1
ISN 0095      21 CONTINUE
ISN 0096      22 CONTINUE
ISN 0097      WRITE (1)XYPR

```

```

00009940
00009950
00009960
00009970
00009980
00009990
00010000
00010010
00010020
00010030
00010040
00010050
00010060
00010070
00010080
00010090

```

LEVEL 2.1 (JAN 75) HELP OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.14

```

ISN 0098      23 CONTINUE
ISN 0099      9 RETURN
ISN 0100      END

```

```

00010100
00010110
00010120

```

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FL
STATISTICS SOURCE STATEMENTS = 99, PROGRAM SIZE = 2894, SUBPROGRAM NAME = HELP
STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILATION ***** 92K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75) OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.14

REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMIAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FL

```

ISN 0002      SUBROUTINE CHI2(N,X2,DF,PCHI2,DENS,IER,VO,ANVO)
C
C *****
C * SUBROUTINE CHI2
C *
C * PURPOSE
C * GIVEN A VECTOR OF OBSERAVTIONS, COMPUTES : CHI-SQURE VALUE,
C * FOR CONSTANT, EQUAL TO 9, DEGREES OF FREEDOM, THE
C * ORDINATE OF THE CHI-SQURE AND THE PROBABILITY FOR
C * NORMALITY OF DISTRIBUTION OF THE INPUT VECTOR.
C *
C * USAGE
C * CALL CHI2(N,X2,DF,PCHI2,DENS,IER,VO,ANVO)
C
C * DESCRIPTION OF PARAMETERS
C * N - INPUT NUMBER OF OBSERVATIONS
C * X2 - OUTPUT CHI-SQUARE VALUE
C * DF - INPUT DEGREES OF FREEDOM

```

```

00010130
00010140
00010150
00010160
00010170
00010180
00010190
00010200
00010210
00010220
00010230
00010240
00010250
00010260
00010270
00010280
00010290
00010300
00010310

```

```

C *      PCHI2 - OUTPUT PROBABILITY OF NORMALITY OF DISTRIBUTION *00010320
C *      DENS  - OUTPUT DENSITY *00010330
C *      IER   - OUTPUT FFPOR INDEX IN CONNECTION WITH *00010340
C *           SUBROUTINE CDTF *00010350
C *      VO    - INPUT VECTOR OF OBSERVATIONS *00010360
C *      ANVO  - OUTPUT NORMALIZED VECTOR OF OBSERVATIONS *00010370
C *           *C0010380
C *           *C0010390
C *      REMARKS *C0010400
C *      SEE REMARKS OF SUBROUTINES ATTACHED *00010410
C *      SUBROUTINES REQUIRED *00010420
C *      CDTF *00010430
C *      DLGAM *00010440
C *      NDTR  *00010450
C *           *C0010460
C *           *****C0010470

```

```

ISN 0003      IMPLICIT REAL*8(A-H,C-Z)      00010480
ISN 0004      DIMENS ICN VO(N),ANVO(N),IFNVO(12),PND(12),FND(12),FNVO(12) 00010490
ISN 0005      SUMVO=0D0                    00010500
ISN 0006      DO 30 I=1,N                  00010510
ISN 0007      SUMVO=SUMVO+VO(I)            00010520
ISN 0008      30 CONTINUE                  00010530
ISN 0009      AN=DFLOAT(N)                 00010540
ISN 0010      AMEAN=SUMVO/AN               00010550
ISN 0011      TSTD=0D0                    00010560
ISN 0012      DO 40 I=1,N                  00010570
ISN 0013      TSTD=TSTD+(VO(I)-AMEAN)**2  00010580
ISN 0014      40 CONTINUE                  00010590
ISN 0015      VCSTD=DSQRT(TSTD/AN)         00010600
ISN 0016      DO 50 I=1,N                  00010610
ISN 0017      ANVO(I)=(VO(I)-AMEAN)/VCSTD 00010620
ISN 0018      50 CONTINUE                  00010630
ISN 0019      IFNVC(1)=0                  00010640
ISN 0020      DO 60 I=1,N                  00010650

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LEVEL 2.1 (JAN 75) CHI2 OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.19

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ISN 0021      IF(ANVO(I).LT.-2.5D0) IFNVO(1)=IFNVO(1)+1      00010660
ISN 0022      60 CONTINUE *00010670
ISN 0023      IFNVO(12)=0 *00010680
ISN 0024      DO 70 I=1,N *00010690
ISN 0025      IF(ANVO(I).GE.2.5D0) IFNVO(12)=IFNVO(12)+1 *00010700
ISN 0026      70 CONTINUE *00010710
ISN 0027      FBU1=-2.5D0 *00010720
ISN 0028      DO 80 IF=2,11 *00010730
ISN 0029      IFNVO(IF)=0 *00010740
ISN 0030      FBU2=FBU1+0.5D0 *00010750
ISN 0031      DO 90 I=1,N *00010760
ISN 0032      IF(ANVO(I).GE.FBU1.AND.ANVO(I).LT.FBU2) IFNVO(IF)=IFNVO(IF)+1 *00010770
ISN 0033      90 CONTINUE *00010780
ISN 0034      FBU1=FBU2 *00010790
ISN 0035      80 CONTINUE *00010800
ISN 0036      PND(1)=0.00621D0 *00010810
ISN 0037      PND(2)=0.01654D0 *00010820
ISN 0038      PND(3)=0.04406D0 *00010830
ISN 0039      PND(4)=0.09185D0 *00010840
ISN 0040      PND(5)=0.14988D0 *00010850
ISN 0041      PND(6)=0.19146D0 *00010860
ISN 0042      PND(7)=0.19146D0 *00010870
ISN 0043      PND(8)=0.14988D0 *00010880

```

```

ISN 0047      PND(9)=0.09185D0      00010890
ISN 0048      PND(10)=0.04406D0     C0010900
ISN 0049      PND(11)=0.01654D0     C0010910
ISN 0050      PND(12)=0.00621D0     00010920
ISN 0051      DC 100 I=1,12         00010930
ISN 0052      FND(I)=AN*PND(I)      00010940
ISN 0053      100      CCNTINUE      00010950
ISN 0054      DO 110 I=1,12         00010960
ISN 0055      FNV0(I)=DFLOAT(1/FNVO(I)) 00010970
ISN 0056      110      CCNTINUE      00010980
ISN 0057      X2=CDO                C0010990
ISN 0058      DO 120 I=1,12         00011000
ISN 0059      X2=X2+((FNVO(I)-FND(I))*2)/FND(I) 00011010
ISN 0060      120      CCNTINUE      C0011020
ISN 0061      DF=9.0D0              00011030
ISN 0062      CALL CDTR(X2,DF,PCHI2,DENS,IER) 00011040
ISN 0063      PCHI2=1D0-PCHI2       C0011050
ISN 0064      PCHI2=PCHI2*100D0     00011060
ISN 0065      RETURN                 00011070
ISN 0066      END                     00011060

```

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FL

STATISTICS SOURCE STATEMENTS = 65, PROGRAM SIZE = 1732, SUBPROGRAM NAME = CHI2

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILATION *****

96K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

OS/360 FORTRAN H EXTENDED

DATE 76.364/11.17.25

REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMINAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FL

```

ISN 0002      SUBROUTINE CDTR(X,G,P,D,IER)      00011090
C                                                     00011100
C ..... 00011110
C ..... 00011120
C ..... SUBROUTINE CDTR ..... 00011130
C ..... 00011140
C ..... PURPOSE 00011150
C ..... COMPUTES P(X) = PROBABILITY THAT THE RANDOM VARIABLE U, 00011160
C ..... DISTRIBUTED ACCORDING TO THE CHI-SQUARE DISTRIBUTION WITH G 00011170
C ..... DEGREES OF FREEDOM, IS LESS THAN OR EQUAL TO X. F(G,X), THE 00011180
C ..... ORDINATE OF THE CHI-SQUARE DENSITY AT X, IS ALSO COMPUTED. 00011190
C ..... 00011200
C ..... USAGE 00011210
C ..... CALL CDTR(X,G,P,D,IER) 00011220
C ..... 00011230
C ..... DESCRIPTION OF PARAMETERS 00011240
C ..... X - INPUT SCALAR FOR WHICH P(X) IS COMPUTED. 00011250
C ..... G - NUMBER OF DEGREES OF FREEDOM OF THE CHI-SQUARE 00011260
C ..... DISTRIBUTION. G IS A CONTINUOUS PARAMETER. 00011270
C ..... P - OUTPUT PROBABILITY. 00011280
C ..... D - OUTPUT DENSITY. 00011290
C ..... IER - RESULTANT ERROR CODE WHERE 00011300

```

C IER= 0 --- NO ERROR 00011310
 C IER=-1 --- AN INPUT PARAMETER IS INVALID. X IS LESS 00011320
 C THAN 0.0, OR G IS LESS THAN 0.5 OR GREATER 00011330
 C THAN 2*10**(+5). P AND D ARE SET TO -1.E75. 00011340
 C IER=+1 --- INVALID OUTPUT. P IS LESS THAN ZERO OR 00011350
 C GREATER THAN ONE, OR SERIES FOR T1 (SEE 00011360
 C MATHEMATICAL DESCRIPTION) HAS FAILED TO 00011370
 C CONVERGE. P IS SET TO 1.E75. 00011380

C REMARKS 00011390
 C SEE MATHEMATICAL DESCRIPTION. 00011400
 C 00011410
 C SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED 00011420
 C DLGAM 00011430
 C NDTF 00011440
 C 00011450
 C 00011460

C METHOD 00011470
 C REFER TO R.E. BARGMANN AND S.P. GHOSH, STATISTICAL 00011480
 C DISTRIBUTION PROGRAMS FOR A COMPUTER LANGUAGE, 00011490
 C IBM RESEARCH REPORT RC-1094, 1963. 00011500
 C 00011510

C 00011520
 C ISN 0003 IMPLICIT REAL*8(A-H,O-Z) 00011530
 C 00011540

C TEST FOR VALID INPUT DATA 00011550
 C ISN 0004 IF(G-(.5-1.E-5)) 590,10,10 00011560
 C ISN 0005 10 IF(G-2.E+5) 20,20,590 00011570
 C ISN 0006 20 IF(X) 590,30,30 00011580
 C 00011590
 C 00011600
 C 00011610

LEVEL 2.1 (JAN 75) CDTR QS/360 FORTRAN H EXTENDED DATE 76.364/11.17.25

C TEST FOR X NEAR 0.0 00011620
 C ISN 0007 30 IF(X-1.E-8) 40,40,80 00011630
 C ISN 0008 40 P=0.0 00011640
 C ISN 0009 IF(G-2.) 50,60,70 00011650
 C 00011660

C ISN 0010 50 D=1.E75 00011670
 C ISN 0011 GC TO 610 00011680
 C ISN 0012 60 D=0.5 00011690
 C ISN 0013 GC TO 610 00011700
 C ISN 0014 70 D=0.0 00011710
 C ISN 0015 GC TO 610 00011720
 C 00011730

C TEST FOR X GREATER THAN 1.E+6 00011740
 C ISN 0016 80 IF(X-1.E+6) 100,100,90 00011750
 C ISN 0017 90 D=0.0 00011760
 C ISN 0018 P=1.0 00011770
 C ISN 0019 GC TO 610 00011780
 C 00011790
 C 00011800

C SET PROGRAM PARAMETERS 00011810
 C ISN 0020 100 XX=X 00011820
 C ISN 0021 DLXX=DLOG(XX) 00011830
 C ISN 0022 X2=XX/2.D0 00011840
 C ISN 0023 DLX2=DLOG(X2) 00011850
 C ISN 0024 GC=G 00011860
 C 00011870

ISN 0025		G2=GG/2.D0	00011870
	C		00011880
	C	COMPUTE ORDINATE	00011900
	C		00011910
ISN 0026		CALL DLGAM(G2, GLG2, IDK)	00011920
ISN 0027		DD=(G2-1.D0)*DLXX-X2-G2*.67314718J5599453 -GLG2	00011930
ISN 0028		IF(DC-1.68D02) 110,110,120	00011940
ISN 0029	110	IF(DC+1.68D02) 130,130,140	00011950
ISN 0030	120	D=1.E75	00011960
ISN 0031		GC TO 150	00011970
ISN 0032	130	D=0.C	00011980
ISN 0033		GC TO 150	00011990
ISN 0034	140	DC=DEXP(DD)	00012000
ISN 0035		D=DD	00012010
	C		00012020
	C	TEST FOR G GREATER THAN 1000.0	00012030
	C	TEST FOR X GREATER THAN 2000.0	00012040
	C		00012050
ISN 0036	150	IF(G-1000.) 160,160,180	00012060
ISN 0037	160	IF(X-2000.) 190,190,170	00012070
ISN 0038	170	P=1.0	00012080
ISN 0039		GO TO 610	00012090
ISN 0040	180	A=DLCG(XX/GG)/3.D0	00012100
ISN 0041		A=DEXP(A)	00012110
ISN 0042		B=2.D0/(9.D0*GG)	00012120
ISN 0043		C=(A-1.D0+B)/DSORT(B)	00012130
ISN 0044		SC=C	00012140
ISN 0045		CALL NLTR(SC,P,DUMMY)	00012150
ISN 0046		GO TO 430	00012160
	C		00012170
	C	COMPUTE THETA	00012180
	C		00012190

LEVEL 2.1 (JAN 75) CDTR OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.25

ISN 0047	190	K= IDINT(G2)	00012200
ISN 0048		THETA=G2-DFLOAT(K)	00012210
ISN 0049		IF(THETA-1.D-8) 200,200,210	00012220
ISN 0050	200	THETA=0.D0	00012230
ISN 0051	210	THP1=THETA+1.D0	00012240
	C		00012250
	C	SELECT METHOD OF COMPUTING T1	00012260
	C		00012270
ISN 0052		IF(THETA) 230,230,220	00012280
ISN 0053	220	IF(XX-10.D0) 260,260,320	00012290
	C		00012300
	C	COMPUTE T1 FOR THETA EQUALS 0.0	00012310
	C		00012320
ISN 0054	230	IF(X2-1.68D02) 250,240,240	00012330
ISN 0055	240	T1=1.0	00012340
ISN 0056		GO TO 400	00012350
ISN 0057	250	T11=1.D0-DEXP(-X2)	00012360
ISN 0058		T1=T11	00012370
ISN 0059		GO TO 400	00012380
	C		00012390
	C	COMPUTE T1 FOR THETA GREATER THAN 0.0 AND	00012400
	C	X LESS THAN OR EQUAL TO 10.0	00012410
	C		00012420
ISN 0060	260	SER=X2*(1.D0/THP1 -X2/(THP1+1.D0))	00012430
ISN 0061		J=+1	00012440

ISN 0062		CC=DFLOAT(J)	00012450
ISN 0063		DC 270 IT1=3,30	00012460
ISN 0064		XI=DFLOAT(IT1)	00012470
ISN 0065		CALL DLGAM(XI,FAC,IOK)	00012480
ISN 0066		TLOG= XI*DLX2-FAC-DLOG(XI+THETA)	00012490
ISN 0067		TERM=DEXP(TLOG)	00012500
ISN 0068		TERM=DSIGN(TERM,CC)	00012510
ISN 0069		SER=SER+TERM	00012520
ISN 0070		CC=-CC	00012530
ISN 0071		IF(DABS(TERM)-1.D-9) 280,270,270	00012540
ISN 0072	270	CCONTINUE	00012550
ISN 0073		GO TO 600	00012560
ISN 0074	280	IF(SER) 600,600,290	00012570
ISN 0075	290	CALL DLGAM(THP1,GTH,IOK)	00012580
ISN 0076		TLOG=THETA*DLX2+DLOG(SER)-GTH	00012590
ISN 0077		IF(TLOG+1.68D02) 300,300,310	00012600
ISN 0078	300	T1=0.0	00012610
ISN 0079		GO TO 400	00012620
ISN 0080	310	T11=DEXP(TLOG)	00012630
ISN 0081		T1=T11	00012640
ISN 0082		GO TO 400	00012650
	C		00012660
	C	COMPUTE T1 FOR THETA GREATER THAN 0.0 AND	00012670
	C	X GREATER THAN 10.0 AND LESS THAN 2000.0	00012680
	C		00012690
ISN 0083	320	A2=C.D0	00012700
ISN 0084		DC 340 I=1,25	00012710
ISN 0085		XI=DFLOAT(I)	00012720
ISN 0086		CALL DLGAM(THP1,GTH,IOK)	00012730
ISN 0087		T11=-(13.D0*XX)/XI +THP1*DLOG(13.D0*XX/XI) -GTH-DLOG(XI)	00012740
ISN 0088		IF(T11+1.68D02) 340,340,330	00012750
ISN 0089	330	T11=DEXP(T11)	00012760
ISN 0090		A2=A2+T11	00012770

LEVEL 2.1 (JAN 75)

CDTR

CS/360 FORTRAN H EXTENDED

DATE 76.364/11.17.25

ISN 0091	340	CONTINUE	00012780
ISN 0092		A=1.01282051+THETA/156.D0-XX/312.D0	00012790
ISN 0093		B=DABS(A)	00012800
ISN 0094		C= -X2+THP1*DLX2+DLOG(B)-GTH-3.951243718531427	00012810
ISN 0095		IF(C+1.68D02) 370,370,350	00012820
ISN 0096	350	IF (A) 360,370,380	00012830
ISN 0097	360	C=-DEXP(C)	00012840
ISN 0098		GO TO 390	00012850
ISN 0099	370	C=0.D0	00012860
ISN 0100		GO TO 390	00012870
ISN 0101	380	C=DEXP(C)	00012880
ISN 0102	390	C=A2+C	00012890
ISN 0103		T11=1.D0-C	00012900
ISN 0104		T1=T11	00012910
	C		00012920
	C	SELECT PROPER EXPRESSION FOR P	00012930
	C		00012940
ISN 0105	400	IF(G-2.) 420,410,410	00012950
ISN 0106	410	IF(G-4.) 450,460,460	00012960
	C		00012970
	C	COMPUTE P FOR G GREATER THAN ZERO AND LESS THAN 2.0	00012980
	C		00012990
ISN 0107	420	CALL DLGAM(THP1,GTH,IOK)	00013000
ISN 0108		DT2=THETA*DLXX-X2-THP1*.6931471805599453 -GTH	00013010

ISN 0109		IF(DT2+1.68D02) 430,430,440	00013020
ISN 0110	430	P=T1	00013030
ISN 0111		GC TC 490	00013040
ISN 0112	440	DT2=DEXP(DT2)	00013050
ISN 0113		T2=DT2	00013060
ISN 0114		P=T1+T2+T2	00013070
ISN 0115		GC TO 490	00013080
	C		00013090
	C	COMPUTE P FOR G GREATER THAN OR EQUAL TO 2.0	00013100
	C	AND LESS THAN 4.0	00013110
	C		00013120
ISN 0116	450	P=T1	00013130
ISN 0117		GC TO 490	00013140
	C		00013150
	C	COMPUTE P FOR G GREATER THAN OR EQUAL TO 4.0	00013160
	C	AND LESS THAN OR EQUAL TO 1000.0	00013170
	C		00013180
ISN 0118	460	DT3=0.00	00013190
ISN 0119		DC 480 I3=2,K	00013200
ISN 0120		THPI=DFLGAT(I3)+THETA	00013210
ISN 0121		CALL DLGAM(THPI,GTH,I0K)	00013220
ISN 0122		DLT3=THPI*DLX2-DLXX-X2-GTH	00013230
ISN 0123		IF(DLT3+1.68D02) 480,480,470	00013240
ISN 0124	470	DT3=DT3+DEXP(DLT3)	00013250
ISN 0125	480	CONTINUE	00013260
ISN 0126		T3=DT3	00013270
ISN 0127		P=T1-T3-T3	00013280
	C		00013290
	C	SET ERROR INDICATOR	00013300
	C		00013310
ISN 0128	490	IF(P) 500,520,520	00013320
ISN 0129	500	IF(DABS(P)-1.E-7) 510,510,600	00013330
ISN 0130	510	P=0.0	00013340
ISN 0131		GC TO 610	00013350

LEVEL 2.1 (JAN 75) CDTF OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.25

ISN 0132	520	IF(1.-P) 530,550,550	00013360
ISN 0133	530	IF(DABS(1.-P)-1.E-7) 540,540,600	00013370
ISN 0134	540	P=1.0	00013380
ISN 0135		GC TO 610	00013390
ISN 0136	550	IF(P-1.E-8) 560,560,570	00013400
ISN 0137	560	P=0.0	00013410
ISN 0138		GC TO 610	00013420
ISN 0139	570	IF((1.0-P)-1.E-8) 580,580,610	00013430
ISN 0140	580	P=1.0	00013440
ISN 0141		GC TO 610	00013450
ISN 0142	590	IER=-1	00013460
ISN 0143		D=-1.E75	00013470
ISN 0144		P=-1.E75	00013480
ISN 0145		GC TO 620	00013490
ISN 0146	600	IER=+1	00013500
ISN 0147		P= 1.E75	00013510
ISN 0148		GC TO 620	00013520
ISN 0149	610	IER=0	00013530
ISN 0150	620	RETURN	00013540
ISN 0151		END	00013550

*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NGANSF NOTERMINAL FL

STATISTICS SOURCE STATEMENTS = 150, PROGRAM SIZE = 2836, SUBPROGRAM NAME = CDT8

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILATION *****

64K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

CS/360 FORTRAN H EXTENDED

DATE 76.364/11.17.48

REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMINAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE) SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NGANSF NOTERMINAL FL

ISN 0002

SUBROUTINE DLGAM(XX,DLNG,IER)

00013560

C *****

00013570

C * * * * *

00013580

C * SUBROUTINE DLGAM

00013590

C * * * * *

00013600

C * PURPOSE

00013610

C * COMPUTES THE DOUBLE PRECISION NATURAL LOGARITHM OF THE

00013620

C * GAMMA FUNCTION OF A GIVEN DOUBLE PRECISION ARGUMENT.

00013630

C * * * * *

00013640

C * USAGE

00013650

C * CALL DLGAM(XX,DLNG,IER)

00013660

C * * * * *

00013670

C * DESCRIPTION OF PARAMETERS

00013680

C * XX - THE DOUBLE PRECISION ARGUMENT FOR THE LOG GAMMA

00013690

C * FUNCTION.

00013700

C * DLNG - THE RESULTANT DOUBLE PRECISION LOG GAMMA FUNCTION

00013710

C * VALUE.

00013720

C * IER - RESULTANT ERROR CODE WHERE

00013730

C * IER = 0 ---- NO ERROR.

00013740

C * IER = -1 ---- XX IS WITHIN 10**(-9) OF BEING ZERO

00013750

C * OR XX IS NEGATIVE. DLNG IS SET

00013760

C * TO -1.0D75.

00013770

C * IER = +1 ---- XX IS GREATER THAN 10**70. DLNG IS SET

00013780

C * TO +1.0D75.

00013790

C * * * * *

00013800

C * REMARKS

00013810

C * .NONE

00013820

C * * * * *

00013830

C * SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED

00013840

C * NONE

00013850

C * METHOD

00013860

C * * * * *

00013870

C * THE EULER-MCLAURIN EXPANSION TO THE SEVENTH DERIVATIVE TERM

00013880

C * IS USED, AS GIVEN BY M. ABPAMOWITZ AND I.A. STEGUN,

00013890

C * 'HANDBOOK OF MATHEMATICAL FUNCTIONS', U. S. DEPARTMENT OF

00013900

C * COMMERCE, NATIONAL BUREAU OF STANDARDS APPLIED MATHEMATICS

00013910

C * SERIES. 1966, EQUATION 6.1.41.

00013920

C * * * * *

00013930

C *****

00013940

C * * * * *

00013950

ISN 0003 IMPLICIT REAL*8(A-H,O-Z)

00013960

ISN 0004 IER=0

00013970

ISN 0005 ZZ=XX

00013980

ISN 0006 IF(XX-1.D10) 2,2,1

00013990

ISN 0007 1 IF(XX-1.D70) 8,9,9

00014000

```

C
C      SEE IF XX IS NEAR ZERO OR NEGATIVE
C
ISN 0008      2  IF(XX-1.D-9) 3,3,4
ISN 0009      3  IF P=-1
ISN 0010      DLNG=-1.D75
ISN 0011      GC TC 10
C

```

```

C0014010
C0014020
C0014030
C0014040
C0014050
C0014060
C0014070
C0014080

```

LEVEL 2.1 (JAN 75) DLGAM OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.43

```

C
C      XX GREATER THAN ZERO AND LESS THAN OR EQUAL TO 1.D+10
C
ISN 0012      4  TERM=1.D0
ISN 0013      5  IF(ZZ-19.D0) 6,6,7
ISN 0014      6  TERM=TERM*ZZ
ISN 0015      ZZ=ZZ+1.D0
ISN 0016      GC TO 5
ISN 0017      7  RZ2=1.D0/ZZ**2
ISN 0018      DLNG=(ZZ-0.5D0)*DLOG(ZZ)-ZZ +0.9189385332046727D0-DLOG(TERM)+
&(1.D0/ZZ)*(.8333333333333333D-1-(RZ2*(.2777777777777777D-2+(RZ2*
&(.7936507936507936D-3-(RZ2*(.5952380952380952D-3))))))
ISN 0019      GC TO 10
C

```

```

00014090
00014100
00014110
00014120
00014130
00014140
00014150
00014160
00014170
00014180
00014190
00014200

```

```

C
C      XX GREATER THAN 1.D+10 AND LESS THAN 1.D+70
C
ISN 0020      8  DLNG=ZZ*(DLOG(ZZ)-1.D0)
ISN 0021      GC TO 10
C
C      XX GREATER THAN OR EQUAL TO 1.D+70
C
ISN 0022      9  IER=+1
ISN 0023      DLNG=1.D75
ISN 0024      10 RETURN
ISN 0025      END
C

```

```

00014210
00014220
00014230
00014240
00014250
00014260
00014270
00014280
00014290
00014300
00014310
00014320

```

```

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FL
*STATISTICS* SOURCE STATEMENTS = 24. PROGRAM SIZE = 710. SUBPROGRAM NAME = DLGAM
*STATISTICS* NO DIAGNOSTICS GENERATED
***** END OF COMPILATION *****
104K BYTES OF CORE NOT USED

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LEVEL 2.1 (JAN 75) DLGAM OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.55

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REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMIAL
OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FL

```

```

ISN 0002      SUBROUTINE NDTR(X,P,D)
C
C      *****
C      *
C      * SUBROUTINE NDTR
C      *
C

```

```

00014330
00014340
00014350
00014360
00014370
00014380

```

```

C * PURPOSE 00014390
C * COMPUTES Y = P(X) = PROBABILITY THAT THE RANDOM VARIABLE U, 00014400
C * DISTRIBUTED NORMALLY(0,1), IS LESS THAN OR EQUAL TO X. 00014410
C * F(X), THE ORDINATE OF THE NORMAL DENSITY AT X, IS ALSO 00014420
C * COMPUTED. 00014430
C * 00014440
C * USAGE 00014450
C * CALL NDTR(X,P,D) 00014460

```

```

C * DESCRIPTION OF PARAMETERS 00014470
C * X - INPUT SCALAR FOR WHICH P(X) IS COMPUTED. 00014480
C * P - OUTPUT PROBABILITY. 00014490
C * D - OUTPUT DENSITY. 00014500
C * 00014510
C * 00014520
C * REMARKS 00014530
C * MAXIMUM ERROR IS 0.0000007. 00014540

```

```

C * SUBROUTINES AND SUBPROGRAMS REQUIRED 00014550
C * NONE 00014560
C * 00014570
C * METHOD 00014580
C * BASED ON APPROXIMATIONS IN C. HASTINGS, APPROXIMATIONS FOR 00014590
C * DIGITAL COMPUTERS, PRINCETON UNIV. PRESS, PRINCETON, N.J., 00014600
C * 1955. SEE EQUATION 26.2.17, HANDBOOK OF MATHEMATICAL 00014610
C * FUNCTIONS, ABRAMOWITZ AND STEGUN, DOVER PUBLICATIONS, INC., 00014620
C * NEW YORK. 00014630
C * 00014640
C * 00014650
C * 00014660

```

```

ISN 0003      IMPLICIT REAL*8(A-H,O-Z) 00014670
ISN 0004      AX=DABS(X) 00014680
ISN 0005      T=1.00/(1.00+.2316419D0*AX) 00014690
ISN 0006      D=0.3989423D0*DEXP(-X*X/2.00) 00014700
ISN 0007      P=1.00D-D*T*(((1.330274D0*T-1.821256D0)*T+1.781478D0)*T- 00014710
              & 0.3565638D0)*T+0.3193815D0) 00014720
ISN 0008      IF(X)1,2,2 00014730
ISN 0009      1 P=1D0-P 00014740
ISN 0010      2 RETURN 00014750
ISN 0011      END 00014760

```

```

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FI
*STATISTICS* SOURCE STATEMENTS = 10, PROGRAM SIZE = 504, SUBPROGRAM NAME = NDTR
*STATISTICS* NO DIAGNOSTICS GENERATED

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LEVEL 2.1 ( JAN 75 ) OS/360 FORTRAN H EXTENDED DATE 76.364/11.17.56
***** END OF COMPILEATION ***** 104K BYTES OF COPE NOT USED

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LEVEL 2.1 ( JAN 75 ) OS/360 FORTRAN H EXTENDED DATE 76.364/11.18.00

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```

REQUESTED OPTIONS: OPT=2,NOMAP,NOXREF,NOTERMINAL
OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMINAL FI

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```

ISN 0002      SUBROUTINE COF1(N,RHO,RHO2,T,AN,V1,V2,W1,SPR,IER1)      00014700
C                                                     00014790
C *****C0014800
C *                                                     *00014810
C *   SUBROUTINE COF1                                             *C0014820
C *                                                     *00014830
C *   PURPOSE                                                     *C0014840
C *   GIVEN TWO VECTORS, ONE OF THEM TREATED AS FIXED AND THE   *00014850
C *   OTHER WEIGHTED, CORRELATION TEST IS PERFORMED. THE        *C0014860
C *   COEFFICIENT OF CORRELATION IS CALCULATED. TESTING OF      *00014870
C *   THE HYPOTHESIS : RHO = 0, IS ALSO PERFORMED.              *00014880
C *   *00014890
C *   USAGE                                                         *C0014900
C *   CALL COF1(N,RHO,RHO2,T,AN,V1,V2,W1,SPR,IER1)              *00014910
C *   *00014920
C *   DESCRIPTION OF PARAMETERS                                     *00014930
C *   N   - INPUT LENGTH OF VECTORS                               *C0014940
C *   RHO - OUTPUT CORRELATION COEFFICIENT                        *00014950
C *   RHO2 - OUTPUT SQUARE OF RHO                               *00014960
C *   T   - OUTPUT QUANTITY FOR THE COMPARISON WITH STUDENTS T *C0014970
C *   AN  - OUTPUT DEGREES OF FREEDOM FOR STUDENTS TEST         *00014980
C *   V1  - INPUT WEIGHTED VECTOR                               *00014990
C *   V2  - INPUT FIXED VECTOR                                  *00015000
C *   W1  - INPUT VECTOR OF WEIGHTS OF V1                       $00015010
C *   SPR - OUTPUT PROBABILITY FOR WHICH THE HYPOTHESIS :      *00015020
C *         RHO = 0, IS ACCEPTED                                 *00015030
C *   IER1 - ERROR INDEX IN CONNECTION WITH SUBROUTINE STUDNT  *00015040
C *   *C0015050
C *   SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED              *C0015060
C *   STUDNT                                                    *00015070
C *   FCT                                                         *00015080
C *   NDTR                                                        *00015090
C *   *00015100
C *****C0015110
ISN 0003      IMPLICIT REAL*8(A-H,O-Z)                               00015120
ISN 0004      DIMENSION V1(N),V2(N),W1(N)                            00015130
C                                                     00015140
C   SUM OF THE WEIGHTS W1                                          00015150
C                                                     00015160
C   *00015170
ISN 0005      SUMW1=0D0                                             00015180
ISN 0006      DO 20 I=1,N                                           00015190
ISN 0007      SUMW1=SUMW1+W1(I)                                       00015200
ISN 0008      20 CONTINUE                                             00015210
C                                                     00015220
C   COMPUTE WEIGHTED MEANS                                          00015230
C                                                     00015240
ISN 0009      AVV1=0D0                                              00015250
ISN 0010      AVV2=0D0                                              00015260
ISN 0011      DO 30 I=1,N                                           00015270
ISN 0012      AVV1=AVV1+V1(I)*W1(I)                                    00015280
ISN 0013      AVV2=AVV2+V2(I)*W1(I)                                    00015290
ISN 0014      30 CONTINUE                                             00015300

```

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ISN 0015      AVV1=AVV1/SUMW1                                       00015310
ISN 0016      AVV2=AVV2/SUMW1                                       00015320
C                                                     00015330
C   COMPUTE WEIGHTED COVARIANCE BETWEEN THE TWO VECTORS V1 AND V2 00015340

```

	C		00015320
	C	V1A=V1,V2A=V2	00015320
ISN 0017		DC 40 I=1,N	00015370
ISN 0018		V1(I)=V1(I)-AVV1	00015380
ISN 0019		V2(I)=V2(I)-AVV2	00015390
ISN 0020	40	CONTINUE	00015400
ISN 0021		COV=000	00015410
ISN 0022		DC 50 I=1,N	00015420
ISN 0023		CCV=CCV+W1(I)*V1(I)*V2(I)	00015430
ISN 0024	50	CONTINUE	00015440
ISN 0025		CCV=COV/SUMW1	00015450
	C		00015460
	C	COVARIANCE SQUARE	00015470
	C		00015480
ISN 0026		CCV2=COV**2	00015490
	C		00015500
	C	COMPUTE VARIANCES OF EACH VECTOR	00015510
	C		00015520
ISN 0027		VARV1=000	00015530
ISN 0028		VARV2=000	00015540
ISN 0029		DC 60 I=1,N	00015550
ISN 0030		VARV1=VARV1+W1(I)*(V1(I)**2)	00015560
ISN 0031		VARV2=VARV2+W1(I)*(V2(I)**2)	00015570
ISN 0032	60	CONTINUE	00015580
ISN 0033		VARV1=VARV1/SUMW1	00015590
ISN 0034		VARV2=VARV2/SUMW1	00015600
	C		00015610
	C	CORRELATION COEFFICIENT	00015620
	C		00015630
ISN 0035		RHO=COV/(DSQRT(VARV1)*DSQRT(VARV2))	00015640
ISN 0036		RHO2=CCV2/(VARV1*VARV2)	00015650
	C		00015660
	C	TEST FOR THE HYPOTHESIS : RHO=0, BY COMPUTING THE QUANTITY T,	00015670
	C	SUBJECT TO COMPARE AGAINST STUDENT'S T FOR N-2 DEGREES OF FREEDOM	00015680
	C		00015690
ISN 0037		AN=DFLOAT(N-2)	00015700
ISN 0038		IF(RHO2.EQ.1D0) GO TO 70	00015710
ISN 0040		T=DSQRT((AN*RHO2)/(1D0-RHO2))	00015720
ISN 0041		NDF=N-2	00015730
ISN 0042		CALL STUDNT(T,NDF,SPR,IER1)	00015740
ISN 0043		GO TO 80	00015750
ISN 0044	70	T=000	00015760
ISN 0045		SPR=10000	00015770
ISN 0046		IER1=0	00015780
ISN 0047	80	RETURN	00015790
ISN 0048		END	00015800

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STATISTICS NO DIAGNOSTICS GENERATED

LEVEL 2.1 (JAN 75) COR1 OS/360 FORTRAN H EXTENDED DATE 76.364/11.18.00

***** END OF COMPILATION *****

100K BYTES OF CORE NOT USED

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REQUESTED OPTICNS: OPT=2,NOMAP,NOXREF,NOTERMIAL

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SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF NOTERMIAL FI

```
ISN 0002          SUBROUTINE STUDNT(T,NDF,ALPHA,IER)          00015810
C                                                         00015820
C *****                                                    *00015830
C *                                                         *00015840
C *   SUBROUTINE STUDNT                                     *00015850
C *                                                         *00015860
C *   PURPOSE                                              *00015870
C *   COMPUTES ALPHA(T) = PROBABILITY THAT THE RANDOM VARIABLE U,*00015880
C *   DISTRIBUTED ACCORDING TO THE STUDENT'S DISTRIBUTION WITH *00015890
C *   NDF DEGREES OF FREEDOM, IS LESS THAN -T AND GREATER THAN +T*00015900
C *                                                         *00015910
C *   USAGE                                                *00015920
C *   CALL STUDNT(T,NDF,ALPHA,IER) ..                      *00015930
C *                                                         *00015940
C *   DESCRIPTION OF PARAMETERS                            *00015950
C *   T   - INPUT SCALAR FOR WHICH ALPHA(T) IS COMPUTED    *00015960
C *   NDF - INPUT DEGREES OF FREEDOM                       *00015970
C *   ALPHA - OUTPUT PROBABILITY                           *00015980
C *   IER  - ERROR CODE RESULTING FROM THE NUMERICAL INTEGRATION*00015990
C *         IF IER NOT ZERO, THEN THE NUMERICAL INTEGRATION *00016000
C *         IS NOT CONVERGING PROPERLY                     *00016010
C *                                                         *00016020
C *   SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED        *00016030
C *   FCT                                                *00016040
C *   NDTR                                               *00016050
C *                                                         *00016060
C *   REMARKS                                              *00016070
C *   FOR DEGREES OF FREEDOM GREATER THAN 110, THE PROBABILITY *00016080
C *   ALPHA(T) IS COMPUTED FROM THE NORMAL DISTRIBUTION,   *00016090
C *   REGARDLESS OF THE DEGREES OF FREEDOM                 *00016100
C *                                                         *00016110
C * *****                                                    *00016120
C                                                         00016130
ISN 0003          IMPLICIT REAL*8(A-H,O-Z)                  00016140
ISN 0004          DIMENSION AUX(100)                        00016150
ISN 0005          DOUBLE PRECISION DABS,FCT                 00016160
ISN 0006          IF(NDF.LT.110) GO TO 100                  00016170
ISN 0008          CALL NDTR(T,ALPHA,DUMMY)                  00016180
ISN 0009          ALPHA=(ALPHA-0.5D0)*200D0                 00016190
ISN 0010          ALPHA=100D0-ALPHA                         00016200
ISN 0011          IER=0                                     00016210
ISN 0012          RETURN                                    00016220
ISN 0013          100 XL=-T                                  00016230
ISN 0014          XU=T                                      00016240
ISN 0015          EPS=0.0001                                00016250
ISN 0016          NDIM=100                                  00016260
ISN 0017          AUX(1)=0.5*(FCT(XL,NDF)+FCT(XU,NDF))     00016270
ISN 0018          H=XU-XL                                   00016280
ISN 0019          IF(NDIM-1) 8,8,1                          00016290
ISN 0020          1 IF(H) 2,10,2                             00016300
ISN 0021          2 HH=H                                     00016310
ISN 0022          E=EPS/DABS(H)                             00016320
ISN 0023          DELT2=0.0                                 00016330
```

ISN C024	P=1.0	00016340
ISN C025	JJ=1	00016350
ISN C026	DO 7 I=2,NDIM	00016360
ISN C027	Y=AUX(1)	00016370
ISN C028	DELT1=DELT2	00016380
ISN C029	HD=HH	00016390
ISN C030	H=0.5*HH	00016400
ISN C031	P=0.5*P	00016410
ISN C032	X=XL+HH	00016420
ISN C033	SM=0.0	00016430
ISN C034	DO 3 J=1,JJ	00016440
ISN C035	SM=SM+FCT(X,NDF)	00016450
ISN C036	X=X+HD	00016460
ISN C037	3 CONTINUE	00016470
ISN C038	AUX(I)=0.5*AUX(I-1)+P*SM	00016480
ISN C039	Q=1.0	00016490
ISN C040	J=I-1	00016500
ISN C041	DO 4 J=1,JI	00016510
ISN C042	II=I-J	00016520
ISN C043	Q=Q+Q	00016530
ISN C044	Q=Q+Q	00016540
ISN C045	AUX(II)=AUX(II+1)+(AUX(II+1)-AUX(II))/(Q-1.0)	00016550
ISN C046	4 CONTINUE	00016560
ISN C047	DELT2=DABS(Y-AUX(1))	00016570
ISN C048	IF(I-5) 7,5,5	00016580
ISN C049	5 IF(DELT2-E) 10,10,6	00016590
ISN C050	6 IF(DELT2-DELT1) 7,11,11	00016600
ISN C051	7 JJ=JJ+JJ	00016610
ISN C052	8 IER=2	00016620
ISN C053	9 Y=H*AUX(1)	00016630
ISN C054	ALPHA=(1.0-Y)*100.0	00016640
ISN C055	RETURN	00016650
ISN C056	10 IER=0	00016660
ISN C057	GO TO 9	00016670
ISN C058	11 IER=1	00016680
ISN C059	Y=Y*H	00016690
ISN C060	ALPHA=(1.0-Y)*100.0	00016700
ISN C061	RETURN	00016710
ISN C062	END	00016720

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STATISTICS NO DIAGNOSTICS GENERATED

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OS/360 FORTRAN H EXTENDED

DATE 76.364/11.18.11

REQUESTED OPTIGNS: OPT=2,NOMAP,NOXREF,NOTERMINAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NCANSF NOTERMINAL

ISN C002 DOUBLE PRECISION FUNCTION FCT(T,NDF)

00016730

ISN 0003	IMPLICIT REAL*8(A-H,O-Z)	00016740
ISN 0004	DOUBLE PRECISION DGAMMA,DSORT	00016750
ISN 0005	FFREEDM=NDP	00016760
ISN 0006	PAI=3.1415926535898	00016770
ISN 0007	A=DGAMMA((FFREEDM+1.0)/2.0)	00016780
ISN 0008	B=DGAMMA(FFREEDM/2.0)	00016790
ISN 0009	C=DSORT(FFREEDM*PAI)*B	00016800
ISN 0010	D=(1.0+T**2/FFREEDM)**(-((FFREEDM+1.0)/2.0))	00016810
ISN 0011	FCT=(A/C)*D	00016820
ISN 0012	RETURN	00016830
ISN 0013	END	00016840

*OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTIONS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NCANSF NOTERMIAL FL

STATISTICS SOURCE STATEMENTS = 12, PROGRAM SIZE = 562, SUBPROGRAM NAME = FCT

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILATION *****

104K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

OS/360 FORTRAN H EXTENDED

DATE 76.364/11.18.16

REQUESTED OPTICNS: OPT=2,NCMAP,NOXREF,NOTERMIAL

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(2) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

SOURCE EBCDIC NOLIST NODECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NCANSF NOTERMIAL FL

ISN 0002	SUBROUTINE MATRIT(A, NZ,MR,IZ,INT,IW)	00016850
----------	---------------------------------------	----------

C THIS SUBROUTINE PRINTS DOUBLE PRECISION MATRICES 5 COLUMNS AND 40 ROWS 00016860

C PAGE 00016870

C A IS THE MATRIX TO BE PRINTED 00016880

C M IS THE ROW DIMENSION OF A 00016890

C N IS THE COLUMN DIMENSION OF A 00016900

C NZ IS THE MAXIMUM ROW DIMENSION OF A IN MAIN 00016910

C MR IS THE NUMBER OF ROWS DESIRED PRINTED ON ONE PAGE 00016920

C IZ IS A FLAG IDENTIFYING A SYMMETRIC MATRIX - 00016930

C 0 - NON-SYMMETRIC 00016940

C 1 - SYMMETRIC 00016950

C INT IS A FLAG INDICATING WHETHER OR NOT THE MATRIX IS TO START PRINTING 00016960

C ON A NEW PAGE - 00016970

C 0 - DO NOT START NEW PAGE 00016980

C 1 START NEW PAGE 00016990

C IW IS THE WRITE CODE OF THE COMPUTER 00017000

C IN CASE OF MORE THAN MR ROWS, THE MATRIX COLUMN CONTINUES IN THE NEXT 00017010

C COLUMN OF THE SAME PAGE 00017020

C A PADING SHOULD BE PRINTED IN THE MAIN PROGRAM . THE MATRIX WILL STA 00017030

C PRINTING ON THE SAME PAGE 00017040

ISN 0003	IMPLICIT REAL*8(A-H,O-Z)	00017050
----------	--------------------------	----------

ISN 0004	DIMENSION A(NZ,NZ),IR(2),NC(5)	00017060
----------	--------------------------------	----------

ISN 0005	COMMON/BLOCK1/M	00017070
----------	-----------------	----------

ISN 0006	N=M	00017080
----------	-----	----------

C INITIALIZE 'INT' TO 0 TO INDICATE THAT OUTPUT IS NOT TO START ON A NEW 00017090

ISN 0007	NC=1	00017100
----------	------	----------

ISN 0008	L1=0	00017110
----------	------	----------

C PROCEDURE TO WRITE MATRIX IF NO. OF ROWS < OR = MR 00017120

ISN 0009	NFW=0	00017130
----------	-------	----------

C PRINT COLUMN NUMBERS 00017140

ISN 0010	C NFW=NC W+5	00017150
----------	--------------	----------

ISN 0011	IF (N.LT.NEW) NEW=N	00017160
ISN 0013	IF (INT.EQ.0) WRITE(IW,100)(I,I=NC,NEW)	00017170
ISN 0015	IF (INT.NE.0) WRITE(IW,200)(I,I=NC,NEW)	00017180
ISN 0017	IF (IZ.EQ.1) GO TO 30	00017190
	C PRINT M ROWS OF MATRIX	00017200
ISN 0019	DC 4 I=1,M	00017210
ISN 0020	4 WRITE(IW,300) I,(A(I,K),K=NC,NEW)	00017220
ISN 0021	37 IF (N.EQ.NEW) RETURN	00017230
ISN 0023	INT=1	00017240
ISN 0024	NC=NC+5	00017250
ISN 0025	GO TO 6	00017260
	C PRINT SYMMETRIC MATRIX WITH <M> ROWS	00017270
ISN 0026	39 DC 36 I=NC,M	00017280
ISN 0027	IF (I.GT.NEW) IN=NEW	00017290
ISN 0029	IF (I.LE.NEW) IN=I	00017300
ISN 0031	36 WRITE(IW,300) I,(A(I,K),K=NC,IN)	00017310
ISN 0032	GO TO 37	00017320
ISN 0033	100 FORMAT('0',18X,I3,4(12X,I3))	00017330
ISN 0034	200 FORMAT('1',18X,I3,4(12X,I3))	00017340
ISN 0035	300 FORMAT(' ',10X,I3,5(3X,D12.5))	00017350
ISN 0036	END	00017360

OPTIONS IN EFFECT*NAME(MAIN) OPTIMIZE(2) LINE-COUNT(60) SIZE(MAX) AUTO(DRL(NLINE))

APPENDIX II

LISTING OF THE GREAT LAKE
LEVEL GAUGE INPUT DATA

(from "Apparent Vertical Movements Over the Great Lakes"
by P.-A. Bolduc)

STATION MINUS STATION

		MM	Standard Deviation MM
LAKE ONTARIO			
Toronto	Kingston	+ 174	9
Toronto	Cape Vincent	+ 116	9
Kingston	Cape Vincent	- 58	6
Oswego	Toronto	- 94	9
Oswego	Kingston	+ 79	6
Oswego	Cape Vincent	+ 21	6
LAKE ERIE			
Port Stanley	Port Colborne	+ 61	15
Port Stanley	Buffalo	+ 3	15
Port Stanley	Cleveland	- 55	15
Buffalo	Port Colborne	- 64	9
Buffalo	Cleveland	- 58	12
Cleveland	Port Colborne	- 6	12

		MM	Standard Deviation MM
--	--	----	--------------------------

LAKE MICHIGAN-HURON

Thessalon	Goderich	- 207	12
Thessalon	Collingwood	0	9
Thessalon	Harbor Beach	- 192	12
Thessalon	Mackinaw City	- 116	12
Goderich	Collingwood	+ 204	15
Goderich	Harbor Beach	+ 15	12
Goderich	Mackinaw City	+ 94	15
Collingwood	Harbor Beach	- 192	6
Collingwood	Mackinaw City	- 113	12
Mackinaw City	Harbor Beach	- 76	12

LAKE SUPERIOR

Point Iroquois	Thunder Bay	+ 58	12
Point Iroquois	Michipicoten	+ 290	9
Point Iroquois	Marquette	- 122	6

		MM	Standard Deviation MM
LAKE SUPERIOR (Cont'd)			
Point Iroquois	Duluth	- 235	12
Michipicoten	Thunder Bay	- 232	15
Michipicoten	Marquette	- 408	9
Michipicoten	Duluth	- 521	15
Thunder Bay	Marquette	- 177	12
Thunder Bay	Duluth	- 290	12
Duluth	Marquette	- 113	9

APPENDIX III

UNB TREATMENT OF LEVEL GAUGE DATA

- (i) "The Use of Lake Gauges in Determining Vertical Crustal Movements" by L.B. Fletcher

ABSTRACT

The growing interest in movements of the earth's upper crust has inspired many investigations in recent years to develop methods wherein these movements could be detected and mathematically modelled.

This paper deals with the mathematical model developed by P. Vanicek and D. Christodoulidis (1973) which predicts vertical crustal movements for the time period of one century. A method is introduced wherein lake gauge data is prepared for further treatment by the above mentioned model, which is based on the fitting, in the least-squares sense, of a surface, describing the crustal velocities. It is concluded that the results obtained from this investigation are useful and are being used in conjunction with geodetic relevelled segments of the first-order levelling network, to produce a crustal velocity map for the Province of Ontario.

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I would also wish to thank Ms. E. Hamilton for her efficient typing of the manuscript.

Introduction

In several scientific and technical disciplines, studies on crustal movements are necessary. Among them are Geodesy, Construction Engineering, Seismology, Geology and Geophysics (Christodulidis 1973). The investigation presented in this paper is a continuation of studies being carried out in the Maritime Provinces (Vaníček 1976) dealing with the determination and prediction of contemporary vertical crustal movements.

The present study deals with the Province of Ontario and was funded by a research contract with Canada Energy, Mines and Resources, Ottawa.

The data used in this study was of two kinds: lake gauge records and geodetic relevelled segments of the first-order levelling network, the former being the subject of this paper.

It should also be understood that the vertical crustal velocities (movements) were assumed to be constant (linear) with time.

1.0 Some Comments on the Gauge Data.

There were twenty permanent lake gauge stations (with sufficient length of record, i.e. greater than 10 years) selected for this study (see Table 1). The data used in this study was obtained from Environment Canada (Marine Environmental Data Services Branch), in which the monthly and yearly mean levels for each station are tabulated sequentially, commencing with the first year of recorded data. Prior to 1968, the monthly mean levels were usually computed from the daily mean levels,

Table 1 - Lake Gauges Used in Study

LAKE GAUGE			POSITION		DATA
No.	Name	Location	ϕ	λ	Record available
10050	Thunder Bay	Lake Superior	48°24.57'	89°13.02'	1915 - 1974
10750	Michipicoten Hbr.	Lake Superior	47°57.73'	84°54.03'	1918 - 1974
10920	Gros Cap	Lake Superior	46°31.76'	84°35.13'	1961 - 1974
11070	Thessalon	Lake Huron	46°15.18'	83°33.11'	1927 - 1974
* 11195	Little Current	Lake Huron	45°58.88'	81°55.69'	1960 - 1974
11375	Parry Sound	Lake Huron	45°20.30'	80°02.15'	1961 - 1974
11500	Collingwood	Lake Huron	44°30.28'	80°13.04'	1916 - 1974
11690	Tobermory	Lake Huron	54°15.52'	81°39.95'	1963 - 1974
11860	Goderich	Lake Huron	43°44.75'	81°43.73'	1920 - 1914
* 11940	Point Edward	Lake Huron	42°59.45'	82°25.29'	1928 - 1974
13030	Port Weller	Lake Ontario	43°14.20'	79°13.20'	1956 - 1974
13320	Toronto	Lake Ontario	43°38.38'	79°22.83'	1911 - 1974
13590	Cobourg	Lake Ontario	43°57.47'	78°09.90'	1957 - 1974
13988	Kingston	Lake Ontario	44°13.05'	76°31.05'	1911 - 1974
11995	Amherstburg	Lake Erie	42°08.66'	83°06.87'	1960 - 1974
12065	Kingsville	Lake Erie	42°01.60'	82°44.09'	1963 - 1974
12250	Erieau	Lake Erie	42°15.62'	81°55.12'	1959 - 1974
12400	Port Stanley	Lake Erie	42°39.54'	81°12.80'	1927 - 1974
12710	Port Dover	Lake Erie	42°46.85'	80°12.10'	1960 - 1974
12865	Port Colbourne	Lake Erie	42°52.44'	79°15.20'	1912 - 1974

* Data Discarded in Analysis (See section 1.10).

but since then, they have been computed from the hourly levels. The yearly means were computed from the daily means. The number of days of record available for each year was indicated and if this was less than one hundred and eighty, the yearly mean was not computed. All elevations given were in feet and, unless otherwise specified, were referred to the International Great Lakes Datum, 1955 (IGLD 1955).

1.10 Problems Encountered With Gauge Data.

The largest problem encountered in treating the data was for the years of data (means) which had been computed using less than 365 days of record. The fact that the yearly means had been computed from, say, the months of March to December or January to September yielded lower or higher yearly means respectively, and so it was decided to discard these yearly means from our data set.

Another problem encountered with two of the gauges on Lake Huron (Point Edward and Little Current), was that they yielded very high residuals, (as shown in Table 2) in the main Vertical Crustal Movement Program (Christodoulidis 1973). These high residuals were attributed to some phenomena such as wind or local freeze-thaw characteristics due to the geographic location of the gauges. Due to the peculiar results obtained, the data for these two gauges was also discarded.

Residuals [cm.]	Gauge 1	Gauge 2
39.184	Little Current	Parry Sound
42.099	Little Current	Collingwood
23.876	Little Current	Tobermory
47.433	Little Current	Goderich
-20.139	Little Current	Point Edward
45.733	Little Current	Thessalon
72.003	Point Edward	Parry Sound
13.958	Point Edward	Collingwood
96.106	Point Edward	Tobermory
24.382	Point Edward	Goderich
19.634	Point Edward	Thessalon

Table 2

Residuals Obtained from Vertical Crustal Movement Program (concerning Point Edward and Little Current).

2.0 Proposed Method for Treatment of Lake Gauge Data.

Firstly, it must be understood that since each lake's water level is regulated independently, we must evaluate the data for each lake separately.

We begin by taking all the possible combinations of pairs of gauges (see Figure 1). For each pair, we have

$$\phi_1, \lambda_1, l_1(t_1), l_1(t_2), l_1(t_3), \dots, l_1(t_n)$$

$$\phi_2, \lambda_2, l_2(t_1), l_2(t_2), l_2(t_3), \dots, l_2(t_n)$$

where

$$t_1 = \min_{1,2} (t_i)$$

$$t_n = \max_{1,2} (t_i)$$

$\phi_1, \lambda_1, \phi_2, \lambda_2$ are the geodetic positions of gauges l_1 and l_2 respectively.

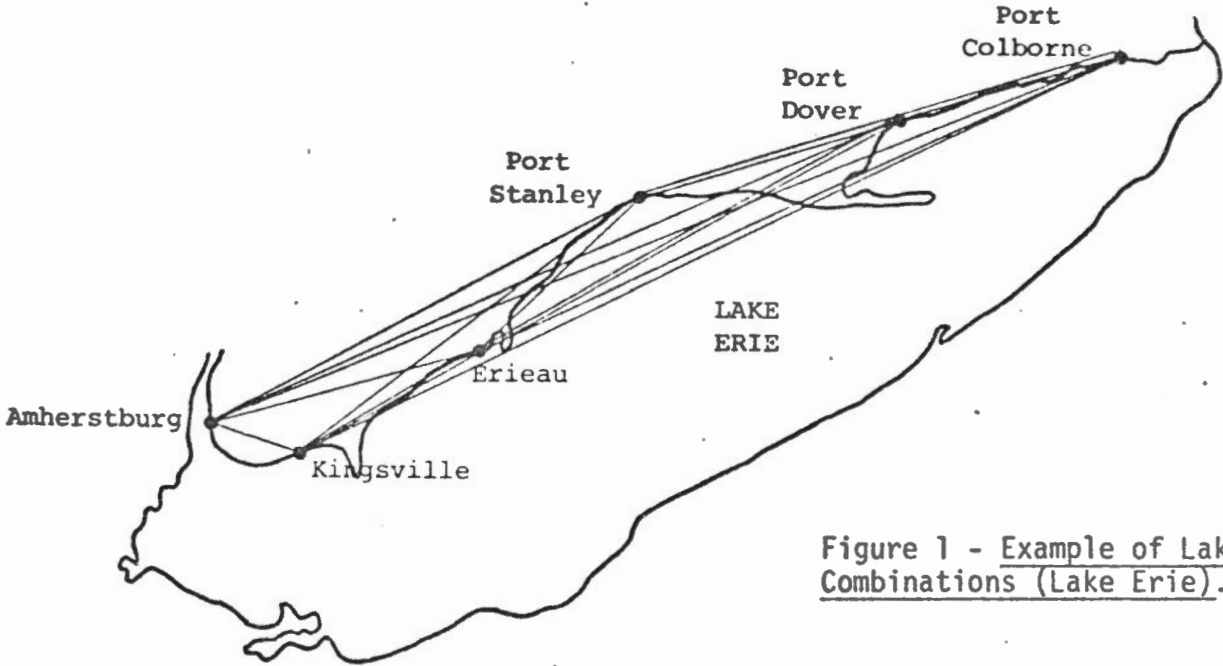


Figure 1 - Example of Lake Gauges Combinations (Lake Erie).

Note that some l_1, l_2 (yearly water means - see section 1.0) will not be available as is graphically represented below (Figure 2).

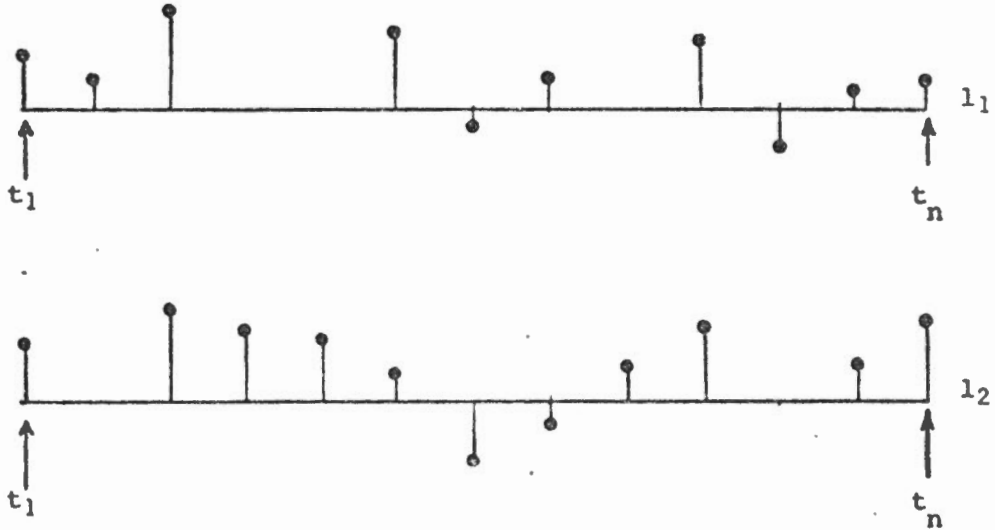


Figure 2 - Graphical Representation of Yearly Water Records.

Next we create a new series, $\Delta l = l_2 - l_1$ defined for only those t_i for which both l_1, l_2 are known (see Figure 3).



Figure 3 - Graphical Representation of the Series $\Delta l = l_2 - l_1$.

This new series is analyzed by a program written by C. Chamberlain (March 1976) which fits a first degree polynomial (straight line) by least squares approximation to the series Δl and gives us b_{Δ} and (as shown in Figures 4 through 6). Figures 4 and 5 show the results (approximate) of Chamberlain's "Approximation Program" when applied to the individual series l_1 and l_2 , and Figure 6 shows the results obtained for the series $\Delta l = l_1 - l_2$.

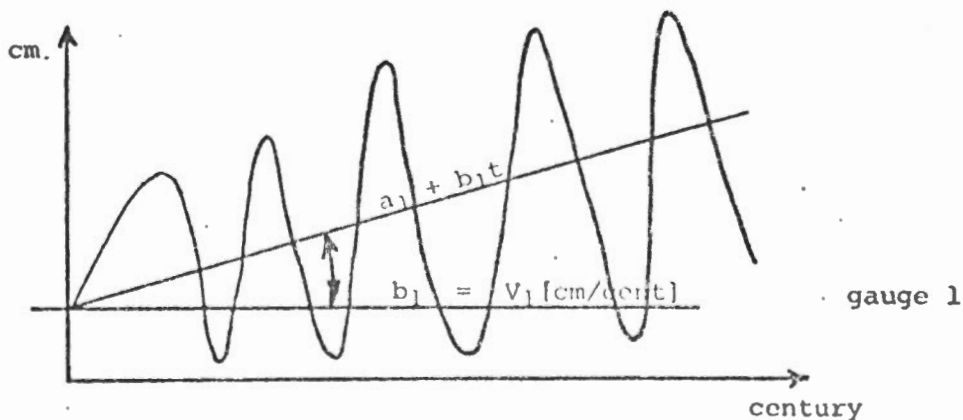


Figure 4 - First Degree Polynomial Fit to the Series l_1 .

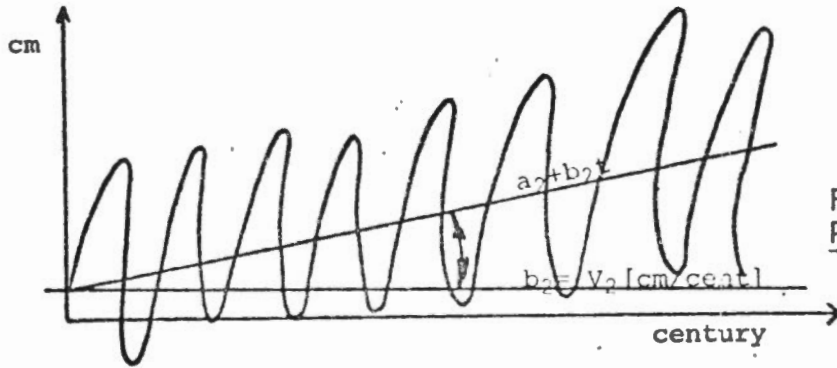


Figure 5 - First Degree Polynomial Fit to the Series 1_2

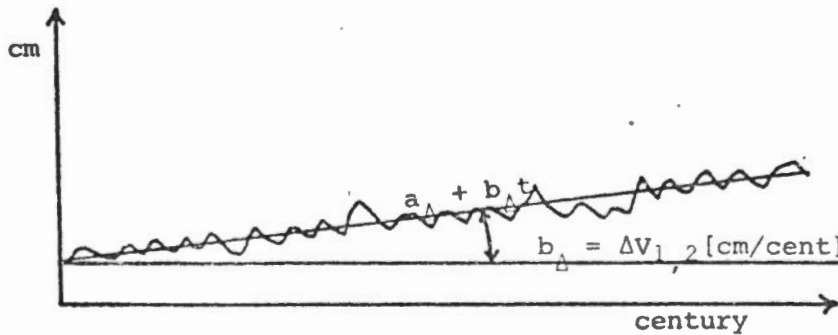


Figure 6 - First Degree Polynomial Fit to the Series $\Delta 1 = 1_2 - 1_1$.

Referring to Figure 6: Every pair of gauges thus represents an element of vertical tilt.

2.1 The Mathematical Model

After obtaining b_Δ and σ_{b_Δ} , we proceed to obtain Δh and $Q_{\Delta h}$ which are explained below. The basic mathematical expression that we begin with is

$$v = \frac{D}{T} \quad 1.02$$

where

v = velocity

D = distance

T = time

Revising equation 1.02 to be in suitable form for the main Crustal Movements program, we get

$$\Delta v_{1,2} = \frac{\overset{\textcircled{2}}{\Delta h_{1,2}} - \overset{\textcircled{1}}{\Delta h_{1,2}}}{\Delta T} \quad 1.03$$

where

$\Delta v_{1,2}$ is the difference in vertical velocities between gauge 1 and gauge 2.

$\Delta h_{1,2}^2$ is the difference in height between gauge 1 and gauge 2 at 'final time'**.

① $\Delta h_{1,2}^1$ is the difference in height between gauge 1 and gauge 2 at 'initial time'*.

We choose $\Delta h_{1,2}^1 = 0$ and $\Delta T = 100$ years, which further simplifies equation 1.03.

$$\Delta v_{1,2} = \frac{\Delta h_{1,2}^2}{100} \quad 1.04$$

since it is desirable to have Δv in units of feet/century and ΔT was chosen to be 100 years.

$$\Delta v_{1,2} = \Delta h_{1,2}^2 = b_{\Delta} \quad 1.05$$

or in simplest terms (1.05) can be expressed as

$$\Delta h(\text{ft}) = b_{\Delta}(\text{ft/century}) \quad 1.06$$

where b_{Δ} comes directly from the aforementioned "Approximation Program" and represents a difference in vertical velocities of the two gauges.

* Initial time is the first year for which l_1 and l_2 are both defined.

** Final time is the last year for which l_1 and l_2 are both defined.

Summarizing to this point, we have calculated differences in vertical velocities for each pair of gauges (and respective standard deviations). An "observation vector" is now formed, containing

$$\Delta h_{1,2i} \text{ where } i = 1, 2, 3, \dots, n \quad 1.07$$

i : is the number of pairs of gauges for the lake being treated.

It should be pointed out, that the reason for forming an observation vector, is that this is the format in which the data is required for the main "Vertical Crustal Movements" program.

2.20 Weighting the Observation Vector

The final task is to compute weights for each of the elements in the "Observation Vector" (also required by Vertical Crustal Movement program).

From equation 1.05, it follows that

$$\sigma_{\Delta V}^2 [\text{cm}^2/\text{cent}^2] = \sigma_{b_{\Delta}}^2 [\text{cm}^2/\text{cent}^2] \quad 1.08$$

and

$$w [\text{cent}^2/\text{cm}^2] = \sigma_{b_{\Delta}}^{-2} [\text{cent}^2/\text{cm}^2] \quad 1.09$$

(weights are inversely proportional to their variance)
(Richardus 1974).

Another requirement of the "Crustal Movement" program is that the weights be a function of time span (ΔT) and distance (as it was designed to treat

tilt elements for levelling) as shown in equation 1.10.

$$W[\text{cent}^2/\text{cm}^2] = Qf[\Delta T, d] \quad 1.10$$

With the above factors in mind, we perform a simple error analysis as follows.

$$\sigma_{\Delta V_{1,2}}^2 = \frac{\sigma_{0,1}^2 \cdot d + \sigma_{0,2}^2 \cdot d}{\Delta T^2} \quad 1.11$$

And from 1st order levelling specifications (accuracy)

$$\sigma_{0,1} = \sigma_{0,2} = 0.13 \text{ cm}/\sqrt{\text{km}} \quad 1.12$$

Simplifying equation 1.11 yields

$$\sigma_{\Delta V_{1,2}}^2 [\text{cm}^2/\text{cent}^2] = \frac{[\sigma_{0,1}^2 + \sigma_{0,1}^2] [\text{cm}^2/\text{km}] \cdot d [\text{km}]}{\Delta T^2 [\text{cent}^2]} \quad 1.13$$

By substituting equation 1.13 into equation 1.09, it follows that

$$\begin{aligned} W[\text{cent}^2/\text{cm}^2] &= \frac{\Delta T^2 [\text{cent}^2]}{2 \cdot \sigma_{0,1} [\text{cm}^2/\text{km}] \cdot d [\text{km}]} \\ &= \frac{\Delta T^2 [\text{cent}^2]}{2 \cdot 0.0169 [\text{cm}^2/\text{km}] \cdot d [\text{km}]} \\ &= Q \frac{\Delta T^2 [\text{cent}^2]}{0.0338} \quad 1.14 \end{aligned}$$

Solving now for Q from equation 1.14, we see that

$$Q = W[\text{cent}^2/\text{cm}^2] \cdot \frac{0.0338 \cdot d [\text{km}]}{\Delta T^2 [\text{cent}^2]} \quad 1.15$$

Recalling that ΔT was chosen to be 100 years [one century], equation 1.15 reduces

$$\begin{aligned} Q &= W[\text{cent}^2/\text{cm}^2] \cdot 0.0338 \cdot d[\text{km}] \\ &= \sigma_{b\Delta}^{-2} [\text{cent}^2/\text{cm}^2] \cdot 0.0338 \cdot d[\text{km}] \end{aligned} \quad 1.16$$

The necessary information (Δh , Q) can be computed now and is in a compatible form for further treatment by the main "Crustal Movement Program".

3.0 Testing the Method.

The method described in sections 2.0, 2.1 and 2.2 was tested on lake gauge data from the following lakes: Lake Huron, Lake Erie, Lake Superior and Lake Ontario.

3.10 Comments on Test Results.

From the results shown in Tables 3 to 6, we see that the magnitude of predicted movements varies from 0.01 ft/century to 1.17 ft/century depicting the most stable and active areas (in terms of uplift or subsidence) in the province.

An interesting aspect of the results are the varying magnitude of weights (computed from equation 1.16). We see that for the combinations of gauges Thessalon to Goderich (Lake Huron) and Thunder Bay to Michipicoten

Table 3 - Test Results from Lake Huron

Gauge Location		Predicted Up-Lift Difference	Wt.
From	To	ft/century	(Q)
Thessalon	Parry Sound	-0.010	0.473
Thessalon	Collingwood	0.282	0.064
Thessalon	Tobermory	0.482	0.213
Thessalon	Goderich	0.634	10.400
Parry Sound	Collingwood	0.068	0.138
Parry Sound	Tobermory	0.720	0.402
Parry Sound	Goderich	0.261	0.082
Collingwood	Tobermory	0.517	0.213
Collingwood	Goderich	0.962	0.043
Tobermory	Goderich	-0.578	0.025

Table 4 - Test Results From Lake Erie

Gauge Location		Predicted Up-Lift Difference	Wt.
From	To	ft/cent	(Q)
Amherstburg	Kingsville	-0.073	0.007
Amherstburg	Erieau	-0.214	0.035
Amherstburg	Port Stanley	-0.320	0.044
Amherstburg	Port Dover	-0.647	0.131
Amherstburg	Port Colborne	-0.156	0.144
Kingsville	Erieau	-0.615	0.027
Kingsville	Port Stanley	-0.430	0.032
Kingsville	Port Dover	-1.169	0.052
Kingsville	Port Colborne	-0.776	0.123
Erieau	Port Stanley	-0.372	0.038
Erieau	Port Dover	-0.471	0.160
Erieau	Port Colborne	0.089	0.291
Port Stanley	Port Dover	-0.218	0.049
Port Stanley	Port Colborne	-0.298	3.800
Port Dover	Port Colborne	0.454	0.148

Table 5 - Test Results From Lake Superior

Gauge Location		Predicted Up-Lift Difference	Wt.
From	To	ft/century	(Q)
Thunder Bay	Michipicoten Hbr.	-0.563	12.357
Thunder Bay	Gros Cap	-0.599	0.064
Michipicoten Hbr.	Gros Cap	-0.317	0.034

Table 6 - Test Results From Lake Ontario

Gauge Location		Predicted Up-Lift Difference	Wt.
From	To	ft/century	(Q)
Port Weller	Toronto	-0.026	0.255
Port Weller	Cobourg	-0.349	0.292
Port Weller	Kingston	-0.707	0.694
Toronto	Cobourg	-0.306	0.093
Toronto	Kingston	-0.700	6.341
Cobourg	Kingston	-0.469	0.270

Harbour (Lake Superior), the respective weights are 10.400 and 12.357 which are several times larger than any of the other gauge combinations. The reason being that the records for both pairs of gauges are very stable, combined with the fact that the common length of records are 47 and 56 years respectively, thereby yielding a small standard deviation (σ_{Δ_b}) which increases the weight. (See equation 1.16).

3.2 Conclusions.

The results attained from this investigation were found to be worthy of further treatment in the program (CRUMOV) developed by P. Vaníček and D. Christodulidis (as mentioned previously) and will be used in the data set together with the levelling segments (=950) in producing the surface velocity map for the Province of Ontario.

REFERENCES

- Christodulidis, D., 1973. Determination of Vertical Crustal Movements From Scattered Relevelings. Unpubl. thesis, University of New Brunswick, Fredericton.
- Christodulidis, D. and Vanicek, P., 1974. "A Method for the Evaluation of Vertical Crustal Movements from Scattered Geodetic Releveling" in Canadian Journal of Earth Science, II, pp. 605 - 610.
- Richardus, P., 1974. Project Surveying. American Elsevier Publishing Company, Inc., New York.
- Marine Environmental Data Service, Ocean and Aquatic Affairs, Department of the Environment, Ottawa, 1975. Monthly and Yearly Mean Water Levels with 10 year and All Time Averages, volume I, Inland.
- Vanicek, P., 1975. "Vertical Crustal Movements in Nova Scotia as Determined From Scattered Geodetic Relevelings". Tectonophysics 29, pp. 183-189.
- Vanicek, P., 1976. "Pattern of Recent Vertical Crustal Movements in Maritime Canada". Canadian Journal of Earth Science 13, pp. 661 - 667.

(ii) Listing of Computer Program

REQUESTED OPTICNS: NCXREF,NOMAP

CPTICNS IN EFFECT: NAME(MAIN) CPTIMIZE(1) LINECCUNT(60) SIZE(MAX) AUTCDBL(NONE)
 SOURCE EBCCIC NCLIST NCCECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

C
C
C
C
C
C

THIS IS PART 'A' OF THE PROGRAM. EACH RECORD CONTAINS LATITUDE AND
 LONGITUDE OF THE STATION AND THE YEARLY MEANS. ALL YEARLY MEANS ARE
 KEPT IN THE MATRIX 'A'. THE LATITUDES AND LONGITUDES ARE KEPT IN THE
 VECTORS ---> PHIC,PHIM,LAMD,LAMM.

```

ISN 0002      IMPLICIT REAL (A-H,O-Z)
ISN 0003      REAL*4 A(71,4)/284*8888./,AA(71,4)/284*8888./,DEL(71)/71*0.0/,
              #PHIC(10),PHIM(10),LAMD(10),LAMM(10),B(100)
ISN 0004      M=71
ISN 0005      N=4
ISN 0006      KK=C
ISN 0007      1 KK=KK+1
ISN 0008      READ(5,5,END=120) (E(L),L=1,16)
ISN 0009      E FCORMAT(1,5,2)
ISN 0010      CC11 J=1,4
ISN 0011      JJ=(J*16)+1
ISN 0012      JK=JJ+15
ISN 0013      READ(5,5,END=120) (E(L),L=JJ,JK)
ISN 0014      CC10 L=JJ,JK
ISN 0015      IF(E(L).EQ.999.)GOTO 14
ISN 0017      NC=L
ISN 0018      10 CCNTINUE
ISN 0019      11 CCNTINUE
ISN 0020      14 CC13 I=1,N0
ISN 0021      AA(I,KK)=B(I)
ISN 0022      IF(I.EQ.NC)GCTC 1
ISN 0024      13 CCNTINUE
ISN 0025      120 CCNTINUE
ISN 0026      CC15 I=1,N
ISN 0027      PHIC(I)=AA(1,I)
ISN 0028      PHIM(I)=AA(2,I)
ISN 0029      LAMD(I)=AA(3,I)
ISN 0030      LAMM(I)=AA(4,I)
ISN 0031      15 CCNTINUE
ISN 0032      CALL MCUTS(AA,M,N,N)
ISN 0033      I=0
ISN 0034      25 I=I+1
ISN 0035      0026 J=1,M
ISN 0036      A(J,I)=AA(J+4,I)
ISN 0037      IF(I.EQ.N.AND.J.EQ.(M-4)) GOTO27
ISN 0039      IF(J.EQ.(M-4))GCTC 25
ISN 0041      26 CCNTINUE
ISN 0042      27 CCNTINUE
ISN 0043      DC30 I=1,N
ISN 0044      EC30 J=1,M
ISN 0045      AA(J,I)=0.0
ISN 0046      30 CCNTINUE
    
```

C
C
C

THIS IS PART 'B' OF THE PROGRAM. IT IS DESIGNED SO THAT THE DATA FOR
 ALL CLAGES IS IN THE CORRECT ORDER SO THAT THE 1974,1973,1972....MEANS

C
C

FOR ALL THE GAUGES ARE IN THE SAME POSITION IN EACH ROW. THIS DATA IS
IN IN THE MATRIX 'AA'.

LEVEL 2.1 (JAN 75)

MAIN

CS/360 FORTRAN H EXTENDED

DATE 76.300/16.22.08

C
C

```
ISN 0047      I=1
ISN 0048      DC35 J=1,N
ISN 0049      KNT=0
ISN 0050      DC36 K=1,M
ISN 0051      IF(A(K,J).GT.888.) KNT=KNT+1
ISN 0053      IF(K.EQ.M) GCTC 40
ISN 0055      36 CCNTINUE
ISN 0056      40 MM=M-KNT
ISN 0057      DC45 JJ=1,MM
ISN 0058      AA(JJ+KNT,1)=A(JJ,I)
ISN 0059      45 CCNTINUE
ISN 0060      I=I+1
ISN 0061      35 CCNTINUE
```

C
C
C
C
C
C

PART 'C' OF THE PROGRAM. CREATES ALL THE POSSIBLE PAIRS OF GAUGES AND
FORMS THEIR CORRESPONDING SERIES 'DELTA' (WHICH EQUALS L2-L1), WHERE
L1,L2,L3..... ARE THE SERIES OF YEARLY MEANS FOR EACH GAUGE.

```
ISN 0062      J=1
ISN 0063      50 LL=0
ISN 0064      J=J+1
ISN 0065      IF(J.EQ.N)GOTO 65
ISN 0067      55 K=1
ISN 0068      LL=LL+1
ISN 0069      IF((J+LL).GT.N)GCTC 50
ISN 0071      60 DEL(K)=AA(K,J+LL)-AA(K,J)
ISN 0072      IF((AA(K,J+LL)).EQ.0.0.AND.(AA(K,J)).EQ.0.0) DEL(K)=0.0
ISN 0074      IF((AA(K,J+LL)).EQ.0.0.AND.(AA(K,J)).NE.0.0) DEL(K)=0.0
ISN 0076      IF((AA(K,J+LL)).NE.0.0.AND.(AA(K,J)).EQ.0.0) DEL(K)=0.0
ISN 0078      K=K+1
ISN 0079      IF(K.LE.N)GCTC 60
ISN 0081      WRITE(6,67)PHID(J),PHIM(J),LAMD(J),LAMM(J)
ISN 0082      WRITE(6,66)PHID(J+LL),PHIM(J+LL),LAMD(J+LL),LAMM(J+LL)
ISN 0083      66 FORMAT('+',T50,2(F5.0,3X,F5.2,3X),5(/))
ISN 0084      67 FORMAT(120(' '),12(/),1X,T22,'PHI(A)',T37,'LAMDA(A)',9X,'PHI(B)',T
      267,'LAMDA(B)',//,1X,T15,2(F5.0,3X,F5.2,3X))
```

C
C
C
C

CALCULATION OF DISTANCE BETWEEN GAUGES (KM.)
(USING MEAN RADIUS OF EARTH = 6371 KM.)

```
ISN 0085      PHIM(J)=PHIM(J)/60.0
ISN 0086      PHIM(J+LL)=PHIM(J+LL)/60.0
ISN 0087      LAMM(J)=LAMM(J)/60.0
ISN 0088      LAMM(J+LL)=LAMM(J+LL)/60.0
ISN 0089      RHID1=PHID(J)+PHIM(J)
ISN 0090      RHID2=PHID(J+LL)+PHIM(J+LL)
ISN 0091      RAMD1=LAMD(J)+LAMM(J)
ISN 0092      RAMD2=LAMD(J+LL)+LAMM(J+LL)
ISN 0093      DP=ABS(RHID1-RHID2)
ISN 0094      CL=ABS(RAMD1-RAMD2)
ISN 0095      DFL=SQRT(DP**2.0+DL**2.0)
ISN 0096      DIST=DFL*111.11
```



```

ISN 0097      PHIM(J)=PHIM(J)*60.0
ISN 0098      PHIM(J+LL)=PHIM(J+LL)*60.0
ISN 0099      LAMM(J)=LAMM(J)*60.0

```

LEVEL 2.1 (JAN 75) MAIN CS/360 FORTRAN H EXTENDED DATE 76.300/16.22.08

```

ISN 0100      LAMM(J+LL)=LAMM(J+LL)*60.0
ISN 0101      WRITE(6,122)DIST
ISN 0102      122 FCRMAT(1),T2C,'DIST=',F8.3)
ISN 0103      CALL TFEND(2,1,DEL,DIST)
ISN 0104      GOTO 55
ISN 0105      65 CCNTINLE

```

END OF PART 'C' OF THE PROGRAM.

```

ISN 0106      STOP
ISN 0107      END

```

```

*OPTICNS IN EFFECT*NAME(MAIN) OPTIMIZE(1) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
*OPTICNS IN EFFECT*SCURCE EBCCIC NCLIST NCDECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NCANSF TERMINAL FLAG
*STATISTICS*      SCURCE STATEMENTS =      106, PROGRAM SIZE =      5250, SUBPROGRAM NAME = MAIN
*STATISTICS*      NO DIAGNOSTICS GENERATED
***** END OF COMPILATION *****

```

72K BYTES OF CCRE NOT USED

LEVEL 2.1 (JAN 75) CS/360 FORTRAN H EXTENDED DATE 76.300/16.22.33

REQUESTED OPTICNS: NOXREF,NOMAF

```

OPTICNS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SCURCE EBCCIC NCLIST NCDECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

```

```

PROGRAM 'LSAPROX' LEAST SQUARES APPROXIMATION
INPLT: CARD 1: JOB TITLE FCRMAT(20A4)
CARD 2: N=NUMBER OF BASE FUNCTIONS
      IW=WEIGHTING CCDE ==> IW=0 READ WEIGHT ON CARD 3
      IW=1 COMPUTE WEIGHT IN FUNCTION
      WEIGHT
FCRMAT(2I4)
CARD TYPE 3: X - VALUE OF BASE POINTS
FUNCTIONAL VALUES OF X
WEIGHT OF X (IF IW=1 LEAVE BLANK)
FORMAT(3F20.0)
NOTE: CARD TYPE 3 IS REPEATED ONCE FOR EACH DATA POINT
CARD TYPE 4: MARKS END OF CARD TYPE 3 -- TYPE -99999.0 IN
COLUMNS 1 - 8
CARD TYPE 5: VALUES OF 'X' AT WHICH APPROXIMATED VALUE IS
DESIRED
NOTE: IF ONLY COEFFICIENTS ARE DESIRED CARD TYPE 5 IS NOT
REQUIRED
NOTES: MAXIMUM DEGREE OF APPROXIMATION FUNCTION IS 50 - TO INCREASE
CHANGE 'NMAX' AND DIMENSION STATEMENT

```

C	MAXIMUM NUMBER OF DATA POINTS IS 100 - TO INCREASE CHANGE	25
C	MMAX AND DIMENSION STATEMENT	26
C		27
C	THE FOLLOWING CHECKS ARE PROVIDED	28
C	(1) N.LT.1	29
C	(2) N.GT.NMAX	30
C	(3) M.GT.MMAX	31
C	(4) N.GT.M	32
C	(5) DETERMINANT OF GRAMM'S MATRIX .LT.SING IE. BASE FUNCTIONS ARE	33
C	NOT LINEARLY INDEPENDENT	34
C		35
C	THE USER MUST SUPPLY TWO DOUBLE PRECISION FUNCTIONS	36
C	(1) FUNCTION WEIGHT -- DESCRIBES THE WEIGHT	37
C	(2) FUNCTION PHI -- DESCRIBES THE BASE FUNCTIONS	38
C		39
C	THE FOLLOWING MINIMUM REQUIREMENTS ARE SUPPLIED	40
C		41
C	FUNCTION WEIGHT(X)	42
C	REAL*8 WEIGHT,X	43
C	WEIGHT=1.000	44
C	RETURN	45
C	END	46
C		47
C	FUNCTION PHI(I,X)	48
C	REAL*8 PHI,X	49
C	PHI=1.000	50
C	RETURN	51
C	END	52
C		53
C	IF THESE ARE NOT SUFFICIENT ADD	54
C		55

LEVEL 2.1 (JAN 75)

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C	(1) WEIGHT=F(X)	56
C	(2) IF(I.EC.1)PHI=F(X)	57
C	IF(I.EC.2)PHI=F(X)	58
C	ETC	59
C		60
C		62
C		63

ISN 0002	SUBROUTINE TREND(N,IW,FX,DIST)	
ISN 0003	IMPLICIT REAL*8 (A-F,C-Z)	64
ISN 0004	REAL*8 NGRM(50,50)	65
ISN 0005	REAL*4 FX(71),ABS,DIST	
ISN 0006	DIMENSION X(100),NAME(20),C(50),W(100),FPHI(50)	66
ISN 0007	DIMENSION EX(100)	
ISN 0008	COMMON SING	67
ISN 0009	EXTERNAL WEIGHT,PHI	68
ISN 0010	NN=71	
ISN 0011	SING=1.00E-25	69
ISN 0012	NMAX=50	71
ISN 0013	MMAX=100	72
ISN 0014	STOP = 999.00	

C	CALCULATION OF K	
C	K=# OF YEARS OF DATA IN THE SERIES-->DEL (INCLUDING GAPS)	
C		

ISN 0015	K=?	
ISN 0016	DCP8 IJ=1,NN	

```

ISN 0017      IF(FX(I,J).EQ.0.0)K=K+1.0
ISN 0019      IF(FX(I,J).NE.0.0)GOTO 92
ISN 0021      88 CCNTINUE
ISN 0022      92 K=NA-K
ISN 0023      DC89 JK=1,K
ISN 0024      X(JK)=JK
ISN 0025      89 CCNTINUE
ISN 0026      M=NA-K
ISN 0027      DC91 I=1,K
ISN 0028      FX(I)=FX(I+M)
ISN 0029      91 CCNTINUE
C             READ NUMBER OF BASE FUNCTIONS AND WEIGHT PARAMETER
C             79
C             80
C             82
C             83
C             84
C             91
C             92
C             93
C             94
ISN 0030      IF(N.LT.1)GC TC 150
ISN 0032      IF(N.GT.NMAX)GC TO 160
ISN 0034      IF(K.GT.NMAX)GC TC 170
ISN 0036      IF(N.GT.K)GC TC 180
C             95
C             96
C             97
C             98
C             99
C             IF WEIGHT NOT ASSIGNED COMPUTE IT
C             100
ISN 0038      IF(IW.EQ.0)GC TC 35
ISN 0040      DC 37 I=1,K
ISN 0041      W(I)=WEIGHT(X(I))
ISN 0042      IF(FX(I).EQ.0.0)W(I)=0.0
ISN 0044      30 CCNTINUE
C             101
C             102
C             103
C             104

```

LEVEL 2.1 (JAN 75) TREND CS/360 FORTRAN H EXTENDED DATE 76.300/16.22.33

```

C FORM THE NORMAL EQUATIONS
C             105
C             106
ISN 0045      35 DC 50 I=1,N
ISN 0046      FPHI(I)=0.0DC
C             107
C             108
ISN 0047      DC 50 J=1,N
ISN 0048      NORM(I,J)=0.0DC
ISN 0049      DO 40 L=1,K
ISN 0050      WW=W(L)
ISN 0051      XX=X(L)
ISN 0052      PHII=PHI(I,XX)
ISN 0053      PHIJ=PHI(J,XX)
ISN 0054      NCRM(I,J)=NCRM(I,J)+WW*PHII*PHIJ
ISN 0055      40 IF(I.EQ.J)FPHI(I)=FPHI(I)+WW*PHII*FX(L)
ISN 0057      50 NORM(J,I)=NORM(I,J)
C             109
C             110
C             111
C             112
C             113
C             114
C             115
C             116
C             117
C             118
C             119
C             120
C             121
ISN 0058      CALL CHCLD(NCRM,NMAX,N,DETA,&190)
C             122
C             123
C             124
C             125
C             COMPUTE THE COEFFICIENTS C(I)
C             126
ISN 0059      DC 60 I=1,N
ISN 0060      C(I)=0.0DC
ISN 0061      DC 60 J=1,N
ISN 0062      60 C(I)=C(I)+NORM(J,I)*FPHI(J)
C             127
C             128
C             129

```

```

C
C  COMPLETE LEAST SQUARES DISTANCE,VARIANCE AND STANDARD DEVIATION
C
ISN 0063      RHC=C.CD0
ISN 0064      CC 80 I=1,K
ISN 0065      WW=W(I)
ISN 0066      XX=X(I)
ISN 0067      PN=0.000
ISN 0068      CC 70 J=1,N
ISN 0069      PN=PN+C(J)*PHI(J,XX)
ISN 0070      80 RHC=RHC+WW*(FX(I)-PN)**2
ISN 0071      MN=K-N
ISN 0072      IF(MN.EQ.0)GC TO 90
ISN 0074      VAR=RHC/DFLCAT(MN)
ISN 0075      STD=DSQRT(VAR)
ISN 0076      TVAR = NCRM(2,2) * VAR
ISN 0077      TSTD = DSQRT ( TVAR)
ISN 0078      TSTD = TSTD * 3048.0
ISN 0079      TFD = C(2) * 3048.0

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C
C  CALCULATION OF DELTA F (FEET)
C
ISN 0080      DELTA=TRC/30.48

```

```

C
C  CALCULATION OF WEIGHT
C
ISN 0081      C=(1.00/(TSTD**2.00))*0.0338*DIST
ISN 0082      INTER=0
ISN 0083      GC TO 100
ISN 0084      90 VAR=0.000
ISN 0085      STD=0.000
ISN 0086      INTER=1

```

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LEVEL 2.1 (JAN 75) TREND CS/360 FORIRAN H. EXTENDED DATE 76.300/16.22.33

```

C  PRINT ALL RESULTS
C
ISN 0087      100 CCNTINUE
ISN 0088      PRINT 1040
ISN 0089      CC 110 I=1,K
ISN 0090      110 PRINT 1050,X(I),FX(I),W(I)
ISN 0091      PRINT 1060
ISN 0092      CC 120 I=1,N
ISN 0093      120 PRINT 1070,I,C(I)
ISN 0094      IF(INTER.EQ.0)PRINT 1080,RHC,VAR,STD
ISN 0096      PRINT 7009
ISN 0097      PRINT 7010,TRD,TSTD
ISN 0098      WRITE(6,7020) DELTA,C
ISN 0099      7020 FORMAT(2(/),T30,'DELTA F (FT) =',F8.3,T55,'Q=',F8.3,/)
ISN 0100      IF(INTER.EQ.1)PRINT 1090
ISN 0102      RETURN
ISN 0103      900 CCNTINUE
ISN 0104      140 STOP
ISN 0105      150 PRINT 1130
ISN 0106      STOP
ISN 0107      160 PRINT 1140,N,NMAX
ISN 0108      STOP
ISN 0109      170 PRINT 1150,K,MMAX
ISN 0110      STOP

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```

ISN 0111      180  PRINT 1160,K,N                                179
ISN 0112      180  STOP                                      180
ISN 0113      190  PRINT 1170                                181
ISN 0114      190  STOP                                      182
ISN 0115      1040 FCRMAT(45X,'INPLT CHECK'//22X,'X',21X,'F(X)',23X,'W(X)'//) 187
ISN 0116      1050 FCRMAT('0',5X,F20.5,5X,F20.5,5X,F20.5) 188
ISN 0117      1060 FCRMAT('-',40X,'COMPUTED COEFFICIENTS') 189
ISN 0118      1070 FCRMAT('0',30X,'C(',12,')',10X,F20.10) 190
ISN 0119      1080 FCRMAT('-',10X,'RHC=',F20.10,10X,'VAR=',F20.10,10X,'STD=',F20.10) 191
ISN 0120      1090 FCRMAT('-',10X,'K=N : RHC=VAR=STD= 0.000') 192
ISN 0121      1130 FCRMAT('0',5X,'ERRCR - DEGREE OF FUNCTION < 1 CHECK DATA CARD 2') 197
ISN 0122      1140 FCRMAT('0',5X,'ERRCR - N=',14,5X,'NMAX=',14,5X,'CHECK DATA CARD 2 198
                    1CF INCREASE NMAX AND DIMENSION') 199
ISN 0123      1150 FCRMAT('0',5X,'ERRCR - K=',14,5X,'NMAX=',14,5X,'CHECK XSTOP OR INC 200
                    1REASE NMAX AND DIMENSION') 201
ISN 0124      1160 FCRMAT('0',5X,'ERRCR - K=',14,5X,'N=',14,5X,'CHECK INPUT OR INCREA 202
                    1SE NO. OF DATA POINTS OR DECREASE NO. OF BASE FUNCTIONS') 203
ISN 0125      1170 FCRMAT('0',5X,'ERRCR - DETERMINANT OF GRAMM'S MATRIX .LT.SING. DE 204
                    1CREASE SING OR CHECK BASE FUNCTIONS OR WEIGHT FUNCTION') 205
ISN 0126      7009 FCRMAT(////,T30,'TREND (CM/CENT)',10X,'STD')
ISN 0127      7010 FCRMAT(T30,F15.10,T50,F15.10,/)
ISN 0128      END

```

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*OPTICNS IN EFFECT*NAME(MAIN) OPTIMIZE(1) LINECUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTICNS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NCMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

STATISTICS SOURCE STATEMENTS = 127, PROGRAM SIZE = 25664, SUBPROGRAM NAME = TREND

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILEATION *****

76K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

CS/360 FORTRAN H EXTENDED

DATE 76.300/16.22.59

REQUESTED OPTICNS: NOXREF,NOMAF

OPTICNS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCDIC NOLIST NODECK OBJECT NCMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

```

ISN 0002      FUNCTION WEIGHT(X)
ISN 0003      REAL*8 WEIGHT,X
ISN 0004      WEIGHT = 1.000
ISN 0005      RETURN
ISN 0006      END

```

*OPTICNS IN EFFECT*NAME(MAIN) OPTIMIZE(1) LINECUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTICNS IN EFFECT*SOURCE EBCDIC NOLIST NODECK OBJECT NCMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

STATISTICS SOURCE STATEMENTS = 5, PROGRAM SIZE = 206, SUBPROGRAM NAME =WEIGHT

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILEATION *****

96K BYTES OF CORE NOT USED

LEVEL 2.1 (JAN 75)

CS/360 FORTRAN H EXTENDED

DATE 76.300/16.23.07

REQUESTED OPTICNS: NOXREF,NOMAF

CPTICNS IN EFFECT: NAME(MAIN) CPTIMIZE(1) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCCIC NCLIST NCDECK OBJECT NCMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

```
ISN 0002      FUNCTION PHI (I,X)
ISN 0003      REAL*8 PHI,X
              C          GO TO BASE FUNCTION (I)
ISN 0004      GC TC (10,20), I
ISN 0005      1C     PHI = 1.000
ISN 0006      RETURN
ISN 0007      2C     PHI = X
ISN 0008      RETURN
ISN 0009      END
```

*CPTICNS IN EFFECT*NAME(MAIN) CPTIMIZE(1) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)

*OPTICNS IN EFFECT*SOURCE EBCCIC NCLIST NCDECK OBJECT NCMAP NOFORMAT GOSTMT NOXREF ALC NCANSF TERMINAL FLAG

STATISTICS SOURCE STATEMENTS = 8, PROGRAM SIZE = 278, SUBPROGRAM NAME = PHI

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPIATION *****

96K BYTES OF CCRE NOT USED

LEVEL 2.1 (JAN 75)

CS/360 FORTRAN H EXTENDED

DATE 76.300/16.23.16

REQUESTED OPTICNS: NCXREF,NOMAP

CPTICNS IN EFFECT: NAME(MAIN) CPTIMIZE(1) LINECOUNT(60) SIZE(MAX) AUTODBL(NONE)
SOURCE EBCCIC NCLIST NCDECK OBJECT NCMAP NCFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

```
ISN 0002      SUBROUTINE CHGLC(A,IRCA,NA,DETA,*)
ISN 0003      DOUBLE PRECISION A,DETA,SUM,SQRT,DSQRT,ABS,DABS,SING
ISN 0004      DIMENSION A(IRCA,NA)
ISN 0005      COMMON SING
ISN 0006      SQRT(SUM) = DSQRT(SUM)
ISN 0007      ABS(DETA) = DABS(DETA)
ISN 0008      DETA = A(1,1)
ISN 0009      A(1,1) = SQRT(A(1,1))
ISN 0010      IF(NA .EQ. 1) GO TO 6
ISN 0012      DO 1 I = 2,NA
ISN 0013      1     A(I,1) = A(I,1) / A(1,1)
ISN 0014      DO 5 J = 2,NA
ISN 0015      SUM = 0.
ISN 0016      J1 = J - 1
ISN 0017      DO 2 K = 1,J1
ISN 0018      2     SUM = SUM + A(J,K) ** 2
ISN 0019      DETA=DETA*(A(J,J)-SUM)
ISN 0020      A(J,J) = SQRT(A(J,J) - SUM)
ISN 0021      IF(J .EQ. NA) GO TO 5
ISN 0023      J2 = J + 1
ISN 0024      DO 4 I = J2,NA
ISN 0025      SUM = 0.
ISN 0026      DO 3 K = 1,J1
ISN 0027      3     SUM = SUM + A(I,K) * A(J,K)
ISN 0028      4     A(I,J) = (A(I,J) - SUM) / A(J,J)
ISN 0029      5     CONTINUE
ISN 0030      6     IF(ABS(DETA).LT.SING)GC TC 16
ISN 0032      DO 7 I = 1,NA
ISN 0033      7     A(I,I) = 1. / A(1,I)
ISN 0034      IF(NA .EQ. 1) GC TC 10
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ISN 0036		N1 = NA - 1	250
ISN 0037		CC 8 J = 1, N1	251
ISN 0038		J2 = J + 1	252
ISN 0039		DC 9 I = J2, NA	253
ISN 0040		SUM = 0.	254
ISN 0041		I1 = I - 1	255
ISN 0042		DO 8 K = J, I1	256
ISN 0043	8	SUM = SUM + A(I, K) * A(K, J)	257
ISN 0044	9	A(I, J) = - A(I, I) * SUM	258
ISN 0045	10	CC 15 J = 1, NA	259
ISN 0046		IF (J .EQ. 1) GC TC 12	260
ISN 0048		J1 = J - 1	261
ISN 0049		DC 11 I = 1, J1	262
ISN 0050	11	A(I, J) = A(J, I)	263
ISN 0051	12	DC 14 I = J, NA	264
ISN 0052		SUM = 0.	265
ISN 0053		DO 13 K = I, NA	266
ISN 0054	13	SUM = SUM + A(K, I) * A(K, J)	267
ISN 0055	14	A(I, J) = SUM	268
ISN 0056	15	CCCONTINUE	269
ISN 0057		RETURN	270
ISN 0058	16	RETURN 1	271
ISN 0059		END	272

LEVEL 2.1 (JAN 75) CHOLD CS/360 FORTRAN H EXTENDED DATE 76.300/16.23.16

*OPTICNS IN EFFECT*NAME(MAIN) OPTIMIZE(1) LINECOUNT(60) SIZE(MAX) AUTOCBL(NONE)

*OPTICNS IN EFFECT*SOURCE EBCCIC NCLIST NCDECK OBJECT NOMAP NOFORMAT GOSTMT NOXREF ALC NOANSF TERMINAL FLAG

STATISTICS SOURCE STATEMENTS = 88, PROGRAM SIZE = 1322, SUBPROGRAM NAME = CHOLD

STATISTICS NO DIAGNOSTICS GENERATED

***** END OF COMPILEATION *****

24K BYTES OF CORE NOT USED

STATISTICS NO DIAGNOSTICS THIS STEP

(iii) Listing of Additional Level Gauge Input Data

PORT WELLER - TORONTO

	PHI(A)		LAMDA(A)		PHI(B)		LAMDA(B)
43.	14.20	79.	13.20	43.	38.38	79.	22.83

DIST= 48.198

INPUT CHECK

X

F(X)

W(X)

1.00000	0.03000	1.00000
2.00000	0.06999	1.00000
3.00000	0.11000	1.00000
4.00000	0.03000	1.00000
5.00000	0.05000	1.00000
6.00000	0.06001	1.00000
7.00000	0.05000	1.00000
8.00000	0.06000	1.00000
9.00000	0.08000	1.00000
10.00000	0.06000	1.00000
11.00000	0.0	0.0
12.00000	0.06000	1.00000
13.00000	0.07001	1.00000
14.00000	0.07001	1.00000
15.00000	0.07001	1.00000
16.00000	0.06001	1.00000
17.00000	0.07001	1.00000
18.00000	0.03000	1.00000
19.00000	0.04001	1.00000

COMPUTED COEFFICIENTS

C(1)	0.0620739176
C(2)	-0.0002641196

RFC= 0.0066551323

VAR= 0.0003914784

TREND (CM/CENT)
-0.805036657

STC
2.5283309324

PORT WELLER - KINGSTON

	PHI(A)		LAMDA(A)		PHI(B)		LAMDA(B)
43.	14.20	79.	13.20	44.	13.05	76.	31.05

DIST= 319.439

INPUT CHECK

X

F(X)

W(X)

1.00000	-0.03000	1.00000
2.00000	0.03999	1.00000
3.00000	0.02000	1.00000
4.00000	0.0	0.0
5.00000	-0.01999	1.00000
6.00000	-0.01999	1.00000
7.00000	-0.03000	1.00000
8.00000	0.00999	1.00000
9.00000	0.01001	1.00000
10.00000	0.02000	1.00000
11.00000	0.0	0.0
12.00000	-0.05000	1.00000
13.00000	-0.03999	1.00000
14.00000	-0.02000	1.00000
15.00000	-0.02000	1.00000
16.00000	-0.06999	1.00000
17.00000	-0.06999	1.00000
18.00000	-0.12001	1.00000
19.00000	-0.09000	1.00000

COMPUTED COEFFICIENTS

C(1)	0.0421773835
C(2)	-0.0070684229

RHC=	0.0151384286	VAR=	0.0008904958
------	--------------	------	--------------

TREND (CM/CENT)	STD
-21.5445531513	3.9451838844

KINGSVILLE - PORT COLBORNE

FPI(A)

LAMDA(A)

FPI(B)

LAMDA(B)

42. 1.60 82. 44.05 42. 52.44 79. 15.20

DIST= 358.122

INPUT CHECK

X	F(X)	W(X)
1.00000	0.12000	1.00000
2.00000	0.11000	1.00000
3.00000	0.14000	1.00000
4.00000	0.12999	1.00000
5.00000	0.13000	1.00000
6.00000	0.16000	1.00000
7.00000	0.02000	1.00000
8.00000	0.09999	1.00000
9.00000	0.15001	1.00000
10.00000	0.06000	1.00000
11.00000	0.05000	1.00000
12.00000	0.03000	1.00000

COMPUTED COEFFICIENTS

C(1)

0.1504518914

C(2)

-0.0077618686

RFC= 0.0167849070

VAR= 0.0016784907

TREND (CM/CENT)
-23.6581753817

STD
10.4425463841

THESSALON - PARRY SOUND

PHI(A)		LAMDA(A)		PHI(B)		LAMDA(B)	
46.	15.1E	83.	33.11	45.	20.30	80.	2.15

DIST= 403.664

INPUT CHECK

X

F(X)

W(X)

1.00000	-0.28000	1.00000
2.00000	0.0	0.0
3.00000	0.0	0.0
4.00000	-0.21001	1.00000
5.00000	-0.22000	1.00000
6.00000	-0.21999	1.00000
7.00000	-0.23000	1.00000
8.00000	-0.20000	1.00000
9.00000	-0.25999	1.00000
10.00000	-0.25000	1.00000
11.00000	-0.22000	1.00000
12.00000	-0.26001	1.00000
13.00000	-0.25000	1.00000
14.00000	-0.23000	1.00000

COMPUTED COEFFICIENTS

C(1) -0.2350074557

C(2) -0.0000989710

RHC= 0.0062904524

VAR= 0.0005242044

TREND (CM/CENT)
-0.3016637267

STD
5.3734182643

PARRY SOUND - GODERICH

PHI(A)		LAMDA(A)		PHI(B)		LAMDA(B)	
45.	20.30	80.	2.15	43.	44.75	81.	43.73

DIST= 258.252

INPUT CHECK

X	F(X)	W(X)
1.00000	0.30000	1.00000
2.00000	0.28000	1.00000
3.00000	0.28999	1.00000
4.00000	0.26001	1.00000
5.00000	0.0	0.0
6.00000	0.34000	1.00000
7.00000	0.29001	1.00000
8.00000	0.39000	1.00000
9.00000	0.37999	1.00000
10.00000	0.41000	1.00000
11.00000	0.30000	1.00000
12.00000	0.36000	1.00000
13.00000	0.30000	1.00000
14.00000	0.25000	1.00000

COMPUTED COEFFICIENTS

C(1)

0.2991294196

C(2)

0.0026132670

RHC= 0.0301823334

VAR= 0.0025151945

TREND (CM/CENT)
7.9652378292

STD
10.2880122749

PARRY SOUND - COLLINGWOOD

PHI(A)		LAMDA(A)		PHI(B)		LAMDA(B)	
45.	20.30	80.	2.15	44.	30.28	80.	13.04

DIST= 54.800

INPUT CHECK

X	F(X)	W(X)
1.00000	0.26001	1.00000
2.00000	0.23000	1.00000
3.00000	0.23000	1.00000
4.00000	0.20000	1.00000
5.00000	0.21001	1.00000
6.00000	0.26999	1.00000
7.00000	0.25000	1.00000
8.00000	0.23000	1.00000
9.00000	0.21999	1.00000
10.00000	0.22000	1.00000
11.00000	0.25000	1.00000
12.00000	0.28000	1.00000
13.00000	0.22000	1.00000
14.00000	0.23999	1.00000

COMPUTED COEFFICIENTS

C(1)	0.2313193856
C(2)	0.0006809109

RHC= 0.0068159110 VAR= 0.0005679926

TREND (CM/CENT)
2.0754163805

STC
4.8161010912

KINGSVILLE - PORT STANLEY

PHI(A)		LAMDA(A)		PHI(B)		LAMDA(B)	
42.	1.60	82.	44.05	42.	39.54	81.	12.80

DIST= 183.073

INPUT CHECK

X	F(X)	W(X)
1.00000	-0.06000	1.00000
2.00000	0.07001	1.00000
3.00000	0.04001	1.00000
4.00000	-0.01001	1.00000
5.00000	0.00999	1.00000
6.00000	0.06000	1.00000
7.00000	-0.06000	1.00000
8.00000	-0.00999	1.00000
9.00000	0.07001	1.00000
10.00000	-0.03999	1.00000
11.00000	-0.09000	1.00000
12.00000	-0.00999	1.00000

COMPUTED COEFFICIENTS

C(1) 0.0254546657
 C(2) -0.0043003109

RFC= 0.0295812316 VAR= 0.0029581232

TREND (CM/CENT) STD
 -13.1073476CE4 13.8629312599

APPENDIX IV

GRAPHICAL DISPLAY OF DATA

ONTARIO
PLOT OF USED DATA
(Relevelled segments and paired
water level gauges.
Water level gauges denoted by dots.)



Dept. of Surveying Engineering
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Fredericton, N. B. Canada

APPENDIX V

LISTING OF INPUT DATA AND RESIDUALS

(i) 2-nd Order Surface

OBSER. NUMBER	OBSER. VECTOR	RESIDUAL	TIME SPAN	PHI A	LAMDA A	PHI B	LAMDA B	WEIGHT
1	0.63835D+00	0.10087D+01	53.00	48 47.30	87 11.00	48 47.40	87 14.20	0.215
2	-0.11502D+01	-0.92314D+00	53.00	48 39.60	86 16.10	48 39.30	86 17.10	0.631
3	0.10208D+02	0.12911D+02	53.00	48 52.90	88 23.60	48 46.80	88 33.10	0.053
4	-0.86839D+01	-0.80904D+01	53.00	49 1.20	88 15.00	48 59.30	88 15.70	0.242
5	0.29905D+01	0.30567D+01	53.00	49 0.20	88 12.50	49 1.20	88 15.00	0.239
6	0.30480D+01	0.31345D+01	3.00	49 51.80	93 21.50	49 52.90	93 21.10	0.001
7	0.11786D+02	0.11901D+02	3.00	49 54.10	93 21.60	49 54.90	93 21.50	0.002
8	0.51816D+01	0.51876D+01	3.00	49 54.90	93 21.50	49 55.40	93 21.10	0.003
9	0.52832D+01	0.55305D+01	3.00	49 55.40	93 21.10	49 56.50	93 21.40	0.001
10	0.50800D+00	0.71884D+00	3.00	49 56.50	93 21.40	49 57.60	93 21.50	0.001
11	-0.31496D+01	-0.30568D+01	3.00	49 57.60	93 21.50	49 57.90	93 21.70	0.005
12	0.13919D+02	0.14172D+02	3.00	49 50.50	93 20.80	49 50.90	93 21.80	0.002
13	0.13716D+02	0.14024D+02	3.00	49 50.10	93 19.50	49 50.50	93 20.80	0.002
14	0.89408D+01	0.92619D+01	3.00	49 49.60	93 18.20	49 50.10	93 19.50	0.001
15	0.11176D+02	0.11599D+02	3.00	49 48.90	93 16.50	49 49.60	93 18.20	0.001
16	-0.29464D+01	-0.26461D+01	3.00	49 48.50	93 15.20	49 48.90	93 16.50	0.002

17	0.81280D+00	0.93439D+00	3.00	49	48.30	93	14.70	49	48.50	93	15.20	0.004
18	0.54864D+01	0.57357D+01	3.00	49	48.50	93	13.20	49	48.30	93	14.70	0.001
19	0.13411D+02	0.13801D+02	3.00	49	48.50	93	11.10	49	48.50	93	13.20	0.001
20	0.19202D+02	0.19351D+02	3.00	49	48.50	93	10.30	49	48.50	93	11.10	0.003
21	-0.92456D+01	-0.89861D+01	3.00	49	48.50	93	8.90	49	48.50	93	10.30	0.002
22	0.67056D+01	0.68539D+01	3.00	49	48.50	93	8.10	49	48.50	93	9.90	0.003
23	0.79248D+01	0.82638D+01	3.00	49	48.60	93	6.20	49	48.50	93	8.10	0.001
24	0.11379D+02	0.11620D+02	3.00	49	48.60	93	4.90	49	48.60	93	6.20	0.002
25	0.25400D+01	0.23665D+01	3.00	49	48.60	93	2.60	49	48.60	93	4.90	0.001
26	-0.17272D+01	-0.14677D+01	3.00	49	48.60	93	1.20	49	48.60	93	2.60	0.002
27	-0.80264D+01	-0.74520D+01	3.00	49	48.60	92	55.80	49	48.60	92	58.90	0.001
28	-0.17272D+01	-0.15048D+01	3.00	49	48.60	92	58.90	49	48.60	93	0.10	0.002
29	-0.14224D+02	-0.14224D+02	3.00	49	48.60	92	58.90	49	48.60	92	58.90	0.028
30	-0.10465D+02	-0.10187D+02	3.00	49	48.60	92	54.30	49	46.50	92	55.80	0.001
31	0.13208D+01	0.16542D+01	3.00	49	48.60	92	52.50	49	48.60	92	54.30	0.001
32	0.81280D+00	0.94245D+00	3.00	49	48.60	92	51.80	49	48.60	92	52.50	0.003
33	-0.27432D+01	-0.25661D+01	3.00	49	46.80	92	50.60	49	47.80	92	51.00	0.001
34	-0.13513D+02	-0.13302D+02	3.00	49	46.70	92	49.50	49	46.80	92	50.60	0.002
35	0.37592D+01	0.38668D+01	3.00	49	46.90	92	48.80	49	46.70	92	49.50	0.003
36	-0.72136D+01	-0.69666D+01	3.00	49	46.80	92	47.50	49	46.90	92	48.80	0.002
37	-0.12192D+02	-0.11873D+02	3.00	49	46.90	92	45.70	49	46.80	92	47.50	0.001
38	-0.18593D+02	-0.18301D+02	3.00	49	46.90	92	44.10	49	46.90	92	45.70	0.001
39	0.97536D+01	0.99725D+01	3.00	49	46.90	92	42.90	49	46.90	92	44.10	0.002
40	0.31496D+01	0.33404D+01	3.00	49	46.60	92	42.00	49	46.90	92	42.90	0.002
41	-0.59944D+01	-0.57347D+01	3.00	49	45.70	92	41.00	49	46.50	92	42.00	0.001
42	0.15240D+01	0.17739D+01	3.00	49	45.30	92	39.80	49	45.70	92	41.00	0.002
43	0.12192D+01	0.14315D+01	3.00	49	44.90	92	38.80	49	45.30	92	39.80	0.002
44	-0.45720D+01	-0.43712D+01	3.00	49	44.40	92	37.30	49	44.90	92	38.80	0.002
45	-0.30480D+00	-0.98199D+01	3.00	49	43.80	92	37.00	49	44.40	92	37.90	0.002
46	-0.33528D+01	-0.32191D+01	3.00	49	43.20	92	36.50	49	43.50	92	37.00	0.002
47	-0.75184D+01	-0.74081D+01	3.00	49	42.90	92	36.00	49	43.20	92	36.50	0.003
48	0.54864D+01	0.57437D+01	3.00	49	42.00	92	34.90	49	42.90	92	36.00	0.001
49	0.28448D+01	0.30294D+01	3.00	49	41.60	92	34.00	49	42.00	92	34.90	0.002
50	-0.97536D+01	-0.96010D+01	3.00	49	41.40	92	33.20	49	41.60	92	34.00	0.003
51	-0.56896D+01	-0.54746D+01	3.00	49	41.30	92	32.00	49	41.40	92	33.20	0.002
52	-0.39624D+01	-0.37998D+01	3.00	49	41.20	92	31.10	49	41.30	92	32.00	0.002
53	-0.35560D+01	-0.33774D+01	3.00	49	41.40	92	30.00	49	41.20	92	31.10	0.002
54	0.14224D+02	0.14330D+02	3.00	49	40.50	92	29.70	49	41.40	92	30.00	0.002
55	0.11278D+02	0.11324D+02	3.00	49	40.00	92	29.60	49	40.50	92	29.70	0.003
56	0.32512D+01	0.34340D+01	3.00	49	39.20	92	28.80	49	40.00	92	29.60	0.002
57	-0.80264D+01	-0.78736D+01	3.00	49	38.90	92	28.00	49	39.20	92	28.80	0.002
58	0.17272D+01	0.19353D+01	3.00	49	38.50	92	26.90	49	38.90	92	28.00	0.002
59	-0.21946D+02	-0.21854D+02	3.00	49	36.70	92	26.90	49	38.50	92	26.90	0.001
60	0.27432D+01	0.29504D+01	3.00	49	36.20	92	25.80	49	36.70	92	26.90	0.002
61	-0.74168D+01	-0.71862D+01	3.00	49	35.50	92	24.60	49	36.20	92	25.80	0.001
62	0.30480D+00	0.68433D+00	3.00	49	35.10	92	22.40	49	35.50	92	24.60	0.001
63	0.22657D+02	0.23026D+02	3.00	49	34.90	92	20.20	49	35.10	92	22.40	0.001
64	0.16967D+02	0.17132D+02	3.00	49	34.90	92	19.20	49	34.90	92	20.20	0.002
65	0.45720D+01	0.47363D+01	3.00	49	34.90	92	18.20	49	34.90	92	19.20	0.002
66	-0.53848D+01	-0.50428D+01	3.00	49	35.00	92	16.10	49	34.90	92	18.20	0.001
67	-0.50800D+01	-0.49992D+01	3.00	49	34.50	92	15.70	49	35.00	92	16.10	0.003
68	0.26111D+02	0.26324D+02	3.00	49	33.90	92	14.50	49	34.50	92	15.70	0.001
69	0.19609D+02	0.19762D+02	3.00	49	33.10	92	12.00	49	33.40	92	12.90	0.002
70	0.35560D+01	0.37764D+01	3.00	49	32.60	92	10.70	49	33.10	92	12.00	0.001
71	-0.85344D+01	-0.83500D+01	3.00	49	32.20	92	9.60	49	32.60	92	10.70	0.002
72	0.11481D+02	0.11707D+02	3.00	49	32.10	92	8.20	49	32.20	92	9.60	0.002
73	0.28448D+01	0.29995D+01	3.00	49	32.50	92	7.20	49	32.10	92	8.20	0.002
74	0.50800D+01	0.52205D+01	3.00	49	31.60	92	6.40	49	32.50	92	7.20	0.001
75	-0.28448D+01	-0.26171D+01	3.00	49	31.20	92	5.00	49	31.60	92	6.40	0.001
76	-0.58929D+01	-0.56971D+01	3.00	49	30.60	92	3.80	49	31.20	92	5.00	0.001
77	-0.61976D+01	-0.60201D+01	3.00	49	30.00	92	2.70	49	30.60	92	3.80	0.002

78	-0.14732D+02	-0.14589D+02	3.00	49	29.80	92	1.80	49	30.00	92	2.70	0.002
79	-0.23368D+01	-0.20533D+01	3.00	49	29.30	92	0.0	49	29.80	92	1.80	0.001
80	-0.15240D+01	-0.13988D+01	3.00	49	29.10	91	59.20	49	29.30	92	0.0	0.003
81	-0.14732D+02	-0.14498D+02	3.00	49	29.00	91	57.70	49	29.10	91	59.20	0.001
82	-0.83312D+01	-0.81318D+01	3.00	49	28.30	91	56.40	49	29.00	91	57.70	0.001
83	-0.34544D+01	-0.29934D+01	3.00	49	27.80	91	53.40	49	28.30	91	56.40	0.001
84	0.75184D+01	0.76695D+01	3.00	49	27.50	91	52.40	49	27.80	91	53.40	0.002
85	0.84328D+01	0.85992D+01	3.00	49	27.30	91	51.30	49	27.50	91	52.40	0.002
86	-0.11786D+02	-0.11602D+02	3.00	49	27.20	91	50.10	49	27.30	91	51.30	0.002
87	-0.50800D+00	-0.30602D+00	3.00	49	27.30	91	48.80	49	27.20	91	50.10	0.002
88	0.11176D+01	0.15429D+01	3.00	49	27.00	91	46.00	49	27.30	91	48.80	0.001
89	0.81280D+00	0.95031D+00	3.00	49	26.30	91	45.00	49	27.00	91	46.00	0.002
90	-0.17272D+01	-0.15996D+01	3.00	49	25.90	91	44.10	49	26.30	91	45.00	0.002
91	0.81280D+01	0.83010D+01	3.00	49	26.10	91	43.00	49	25.90	91	44.10	0.002
92	-0.21336D+01	-0.18675D+01	3.00	49	25.80	91	41.20	49	26.10	91	43.00	0.001
93	0.26416D+01	0.26813D+01	3.00	49	25.10	91	40.80	49	25.80	91	41.20	0.002
94	-0.14122D+02	-0.13951D+02	3.00	49	24.60	91	38.60	49	24.90	91	39.80	0.002
95	-0.40640D+00	-0.34069D+00	3.00	49	23.90	91	38.00	49	24.60	91	38.60	0.002
96	-0.45720D+01	-0.43734D+01	3.00	49	23.60	91	36.60	49	23.90	91	38.00	0.002
97	-0.14224D+02	-0.14113D+02	3.00	49	23.00	91	35.70	49	23.60	91	36.60	0.002
98	-0.13208D+01	-0.90154D+00	3.00	49	21.40	91	32.40	49	23.00	91	35.70	0.001
99	-0.13513D+02	-0.13375D+02	3.00	49	20.90	91	31.30	49	21.40	91	32.40	0.002
100	0.14224D+01	0.15831D+01	3.00	49	20.60	91	30.10	49	20.90	91	31.30	0.002
101	-0.50800D+01	-0.48912D+01	3.00	49	20.30	91	28.70	49	20.60	91	30.10	0.002
102	-0.25806D+02	-0.25510D+02	3.00	49	19.60	91	26.40	49	20.30	91	28.70	0.001
103	-0.32512D+01	-0.30512D+01	3.00	49	19.30	91	24.90	49	19.60	91	26.40	0.001
104	0.10160D+02	0.10231D+02	3.00	49	18.90	91	23.90	49	19.30	91	24.90	0.002
105	-0.18288D+01	-0.18067D+01	3.00	49	18.30	91	22.10	49	18.90	91	23.90	0.001
106	-0.50800D+01	-0.49866D+01	3.00	49	16.80	91	17.40	49	17.30	91	18.30	0.002
107	-0.69088D+01	-0.67957D+01	3.00	49	16.20	91	16.30	49	16.80	91	17.40	0.002
108	-0.11074D+02	-0.10991D+02	3.00	49	15.80	91	15.50	49	16.20	91	16.30	0.002
109	-0.66040D+01	-0.64373D+01	3.00	49	15.20	91	12.00	49	15.40	91	13.30	0.002
110	-0.13208D+02	-0.12934D+02	3.00	49	15.30	91	10.10	49	15.20	91	12.00	0.001
111	-0.67056D+01	-0.65272D+01	3.00	49	15.60	91	9.00	49	15.30	91	10.10	0.002
112	-0.89408D+01	-0.86987D+01	3.00	49	14.80	91	6.30	49	15.60	91	9.00	0.001
113	0.14224D+02	0.14447D+02	3.00	49	14.20	91	0.50	49	14.50	91	2.40	0.001
114	-0.69088D+01	-0.69091D+01	3.00	49	11.60	90	52.40	49	12.40	90	53.00	0.002
115	0.26416D+01	0.27014D+01	3.00	49	11.00	90	51.50	49	11.60	90	52.40	0.002
116	-0.12192D+02	-0.12120D+02	3.00	49	10.40	90	50.50	49	11.00	90	51.50	0.002
117	-0.68072D+01	-0.68689D+01	3.00	49	9.70	90	50.40	49	10.40	90	50.50	0.002
118	-0.12192D+02	-0.12203D+02	3.00	49	9.10	90	50.00	49	9.70	90	50.40	0.002
119	-0.37592D+01	-0.36717D+01	3.00	49	8.80	90	49.10	49	9.10	90	50.00	0.002
120	-0.14732D+02	-0.14634D+02	3.00	49	8.60	90	48.20	49	8.80	90	49.10	0.002
121	-0.12192D+01	-0.11230D+01	3.00	49	7.70	90	44.50	49	7.90	90	45.40	0.002
122	0.91440D+00	0.10161D+01	3.00	49	7.10	90	43.20	49	7.70	90	44.50	0.001
123	-0.73152D+01	-0.73352D+01	3.00	49	5.20	90	42.10	49	5.80	90	42.50	0.002
124	0.20422D+02	0.20430D+02	3.00	49	4.10	90	41.00	49	5.20	90	42.10	0.001
125	0.80264D+01	0.80043D+01	3.00	49	3.40	90	40.50	49	4.10	90	41.00	0.002
126	0.11379D+02	0.11458D+02	3.00	49	2.90	90	39.40	49	3.40	90	40.50	0.002
127	0.17272D+01	0.18296D+01	3.00	49	2.60	90	38.30	49	2.90	90	39.40	0.002
128	-0.15342D+02	-0.15151D+02	3.00	49	2.60	90	36.80	49	2.60	90	38.30	0.001
129	-0.99568D+01	-0.97525D+01	3.00	49	2.80	90	35.40	49	2.60	90	36.80	0.002
130	-0.20726D+02	-0.20586D+02	3.00	49	2.80	90	34.30	49	2.80	90	35.40	0.002
131	0.89408D+01	0.91963D+01	3.00	49	2.80	90	32.30	49	2.80	90	34.30	0.001
132	0.43688D+01	0.45478D+01	3.00	49	2.80	90	30.90	49	2.80	90	32.30	0.002
133	0.54864D+01	0.56399D+01	3.00	49	2.80	90	29.70	49	2.80	90	30.90	0.002
134	-0.52832D+01	-0.51169D+01	3.00	49	2.80	90	28.40	49	2.80	90	29.70	0.002
135	-0.22352D+01	-0.22645D+01	3.00	49	2.40	90	28.20	49	2.80	90	28.40	0.004
136	0.11989D+02	0.11973D+02	3.00	49	2.10	90	28.00	49	2.40	90	28.20	0.005
137	0.16866D+02	0.16921D+02	3.00	49	1.40	90	26.80	49	2.10	90	28.00	0.001
138	-0.83312D+01	-0.82411D+01	3.00	48	58.50	90	20.40	48	58.40	90	21.60	0.002

139	-0.16459D+02	-0.16370D+02	3.00	48	58.10	90	19.20	48	58.50	90	20.40	0.002
140	-0.61976D+01	-0.59672D+01	3.00	48	57.50	90	16.60	48	58.10	90	19.20	0.001
141	0.76200D+01	0.77464D+01	3.00	48	57.20	90	15.20	48	57.50	90	16.60	0.002
142	0.45720D+01	0.46907D+01	3.00	48	56.30	90	8.70	48	56.40	90	9.80	0.002
143	-0.11887D+02	-0.11764D+02	3.00	48	56.00	90	7.30	48	56.30	90	9.70	0.002
144	-0.84328D+01	-0.83400D+01	3.00	48	54.10	90	1.50	48	54.70	90	3.10	0.001
145	0.11684D+02	0.11711D+02	3.00	48	52.50	89	59.00	48	54.10	90	1.50	0.001
146	0.10871D+02	0.10868D+02	3.00	48	52.00	89	58.30	48	52.50	89	59.00	0.002
147	-0.12192D+02	-0.12226D+02	44.00	44	26.50	81	24.20	44	26.70	81	24.10	0.965
148	-0.17387D+01	-0.16956D+01	44.00	44	29.60	81	22.40	44	29.40	81	22.60	0.840
149	0.59319D+01	0.61331D+01	13.00	42	30.10	82	18.40	42	31.40	82	20.00	0.017
150	0.36107D+01	0.39067D+01	13.00	42	31.40	82	20.00	42	33.30	82	22.40	0.011
151	-0.29073D+01	-0.28468D+01	13.00	42	33.30	82	22.40	42	34.00	82	22.80	0.038
152	0.24853D+01	0.25189D+01	13.00	42	35.10	82	22.80	42	35.60	82	23.00	0.055
153	-0.44313D+01	-0.44285D+01	13.00	42	35.60	82	23.00	42	35.70	82	23.00	0.285
154	-0.84172D+01	-0.84172D+01	13.00	42	35.70	82	23.00	42	35.70	82	23.00	0.528
155	-0.86751D+00	-0.91365D+00	13.00	43	1.20	82	19.50	43	1.20	82	19.00	0.083
156	0.67056D+01	0.65565D+01	13.00	43	1.20	82	19.00	43	1.50	82	17.40	0.025
157	0.11020D+01	0.89930D+00	13.00	43	1.50	82	17.40	43	1.70	82	15.20	0.019
158	0.20396D+01	0.18817D+01	13.00	43	1.70	82	15.20	43	2.20	82	13.50	0.022
159	-0.37045D+01	-0.39155D+01	13.00	43	2.20	82	13.50	43	2.60	82	11.20	0.017
160	0.32356D+01	0.31213D+01	13.00	43	2.60	82	11.20	43	2.20	82	9.90	0.029
161	0.16178D+01	0.16074D+01	13.00	43	2.20	82	9.90	43	2.40	82	9.80	0.135
162	0.12895D+01	0.91728D+00	13.00	43	2.40	82	9.80	43	3.20	82	5.70	0.010
163	0.24384D+01	0.24184D+01	13.00	43	3.10	82	0.20	43	4.50	82	0.10	0.020
164	-0.50878D+01	-0.51007D+01	13.00	43	4.50	82	0.10	43	5.80	82	0.10	0.022
165	0.27901D+01	0.27890D+01	13.00	43	5.80	82	0.10	43	5.90	82	0.10	0.285
166	0.11723D+00	0.11723D+00	13.00	43	5.90	82	0.10	43	5.90	82	0.10	0.528
167	-0.14068D+00	-0.12213D+00	13.00	43	5.80	82	0.10	43	5.70	82	0.30	0.168
168	-0.67759D+01	-0.72604D+01	13.00	43	3.20	82	5.70	43	3.10	82	0.20	0.008
169	-0.70338D+00	-0.72502D+00	13.00	43	9.30	81	59.10	43	10.10	81	59.00	0.075
170	-0.21102D+01	-0.22193D+01	13.00	43	10.10	81	59.00	43	10.90	81	57.90	0.026
171	0.42203D+01	0.42185D+01	13.00	43	10.90	81	57.90	43	11.00	81	57.90	0.285
172	0.17116D+01	0.15806D+01	13.00	43	11.80	81	55.00	43	12.80	81	53.70	0.021
173	0.29542D+01	0.29043D+01	13.00	43	12.80	81	53.70	43	12.30	81	53.00	0.041
174	-0.49237D+01	-0.50111D+01	13.00	43	19.00	81	45.30	43	19.70	81	44.50	0.032
175	0.32825D+00	0.23416D+00	13.00	43	19.70	81	44.50	43	20.60	81	43.70	0.027
176	0.14302D+01	0.11637D+01	13.00	43	10.90	81	57.90	43	11.80	81	55.00	0.013
177	-0.63539D+01	-0.72163D+01	13.00	43	12.80	81	53.70	43	19.00	81	45.30	0.003
178	-0.56505D+01	-0.59264D+01	13.00	43	20.60	81	43.70	43	24.80	81	42.10	0.007
179	0.21805D+01	0.21191D+01	13.00	43	24.80	81	42.10	43	26.20	81	42.00	0.020
180	0.29073D+01	0.28307D+01	13.00	43	26.20	81	42.00	43	27.70	81	41.80	0.019
181	0.20398D+01	0.19643D+01	13.00	43	27.70	81	41.80	43	29.10	81	41.60	0.020
182	-0.23466D+01	-0.24056D+01	13.00	43	29.10	81	41.60	43	30.30	81	41.50	0.024
183	0.36576D+01	0.35945D+01	13.00	43	30.30	81	41.50	43	31.50	81	41.40	0.024
184	-0.12426D+01	-0.12947D+01	13.00	43	31.50	81	41.40	43	32.60	81	41.40	0.026
185	0.32356D+01	0.32234D+01	13.00	43	32.60	81	41.40	43	33.70	81	41.90	0.025
186	0.10316D+01	0.10316D+01	13.00	43	33.70	81	41.90	43	33.70	81	41.90	0.528
187	-0.44782D+01	-0.44816D+01	13.00	43	33.70	81	41.90	43	34.10	81	42.10	0.067
188	0.39155D+01	0.38896D+01	13.00	43	34.10	81	42.10	43	35.10	81	42.40	0.028
189	-0.13364D+01	-0.14047D+01	13.00	43	35.10	81	42.40	43	36.40	81	42.40	0.022
190	0.70338D-01	-0.73452D-01	13.00	43	36.40	81	42.40	43	39.00	81	42.40	0.011
191	-0.39858D+01	-0.40732D+01	13.00	43	39.00	81	42.40	43	40.50	81	42.40	0.019
192	-0.56271D+00	-0.61059D+00	13.00	43	40.50	81	42.40	43	41.30	81	42.40	0.036
193	0.60960D+00	0.46686D+00	13.00	43	41.30	81	42.40	43	43.60	81	42.40	0.012
194	0.63305D+00	0.58348D+00	13.00	43	43.60	81	42.40	43	44.50	81	42.50	0.032
195	0.10082D+01	0.10082D+01	13.00	43	44.50	81	42.50	43	44.50	81	42.50	0.528
196	0.36897D+00	0.49809D+00	38.00	42	2.30	82	43.30	42	2.20	82	44.50	0.293
197	-0.66040D+01	-0.65881D+01	12.00	42	1.70	82	44.00	42	1.60	82	44.20	0.143
198	0.32766D+01	0.33385D+01	12.00	42	0.80	82	49.50	42	0.0	82	50.50	0.023
199	0.91440D+01	0.92461D+01	12.00	42	0.0	82	50.50	41	59.10	82	51.90	0.018

200	-0.60196D+01	-0.56580D+01	12.00	41	59.10	82	51.90	41	59.20	82	54.90	0.012
201	0.64008D+01	0.65984D+01	12.00	41	59.20	82	54.90	41	59.30	82	56.50	0.022
202	0.17018D+01	0.18376D+01	12.00	41	59.30	82	56.50	41	59.90	82	57.30	0.030
203	-0.37338D+01	-0.32822D+01	12.00	41	59.90	82	57.30	42	1.50	83	0.20	0.009
204	-0.64770D+01	-0.60832D+01	12.00	42	1.50	83	0.20	42	3.60	83	2.40	0.009
205	0.24892D+01	0.25976D+01	12.00	42	3.60	83	2.40	42	3.80	83	3.20	0.041
206	-0.61722D+01	-0.59969D+01	12.00	42	3.80	83	3.20	42	3.90	83	4.60	0.025
207	-0.40640D+00	-0.15005D+00	12.00	42	3.90	83	4.60	42	3.70	83	6.80	0.016
208	0.20320D+01	0.20740D+01	12.00	42	5.10	83	6.90	42	6.30	83	6.60	0.020
209	-0.56134D+01	-0.55980D+01	12.00	42	8.10	83	6.90	42	9.10	83	6.60	0.024
210	-0.11963D+02	-0.11978D+02	12.00	42	9.10	83	6.60	42	11.20	83	5.60	0.011
211	0.33020D+00	0.51421D+00	12.00	42	11.20	83	5.60	42	13.60	83	6.20	0.010
212	-0.68580D+00	-0.61055D+00	12.00	42	13.60	83	6.20	42	15.30	83	6.20	0.014
213	-0.14224D+01	-0.14224D+01	12.00	42	15.30	83	6.20	42	15.30	83	6.20	0.450
214	0.32766D+01	0.32353D+01	12.00	42	15.30	83	6.20	42	17.10	83	5.20	0.013
215	-0.12700D+01	-0.13180D+01	12.00	42	17.10	83	5.20	42	18.50	83	4.30	0.016
216	0.27940D+01	0.21884D+01	12.00	42	18.50	83	4.30	42	19.70	82	58.60	0.006
217	-0.17272D+01	-0.19026D+01	12.00	42	19.70	82	58.60	42	20.40	82	56.80	0.017
218	0.51308D+01	0.50032D+01	12.00	42	20.40	82	56.80	42	20.30	82	55.70	0.032
219	-0.27178D+01	-0.25611D+01	12.00	42	20.30	82	55.70	42	20.00	82	57.20	0.023
220	0.29718D+01	0.24685D+01	12.00	42	20.00	82	57.20	42	18.70	82	53.20	0.008
221	-0.16256D+01	-0.17372D+01	12.00	42	18.70	82	53.20	42	18.70	82	52.20	0.035
222	0.16695D+01	0.12967D+01	44.00	44	49.00	81	12.70	44	52.10	81	14.20	0.062
223	-0.13716D+01	-0.21287D+01	44.00	44	52.10	81	14.20	44	58.20	81	17.30	0.032
224	0.10668D+01	0.93290D+00	44.00	44	58.20	81	17.30	45	1.40	81	22.10	0.044
225	0.13508D+01	0.10730D+01	44.00	45	1.40	81	22.10	45	4.20	81	24.60	0.062
226	-0.35745D+01	-0.40798D+01	44.00	45	4.20	81	24.60	45	7.50	81	25.70	0.060
227	-0.25709D+01	-0.26332D+01	44.00	45	7.50	81	25.70	45	10.40	81	31.10	0.043
228	-0.46228D+01	-0.45700D+01	6.00	42	35.40	81	31.80	42	34.80	81	32.70	0.007
229	-0.74163D+01	-0.73513D+01	6.00	42	34.80	81	32.70	42	34.10	81	33.80	0.006
230	-0.18796D+01	-0.18217D+01	6.00	42	34.10	81	33.80	42	33.20	81	34.90	0.005
231	0.20320D+01	0.21185D+01	6.00	42	33.20	81	34.90	42	32.20	81	36.40	0.004
232	0.13208D+01	0.13734D+01	6.00	42	32.20	81	36.40	42	31.20	81	37.50	0.005
233	-0.16180D+02	-0.15509D+02	12.00	42	13.20	82	9.50	42	9.40	82	18.70	0.003
234	-0.14935D+02	-0.14332D+02	12.00	42	9.40	82	18.70	42	5.90	82	26.80	0.004
235	-0.24892D+01	-0.24328D+01	12.00	42	5.90	82	26.80	42	5.80	82	27.40	0.057
236	-0.49784D+01	-0.50444D+01	12.00	42	2.80	82	36.10	42	1.70	82	36.20	0.022
237	0.52324D+01	0.51412D+01	12.00	42	1.70	82	36.20	42	1.50	82	35.50	0.047
238	-0.30480D+00	-0.38118D+00	12.00	42	1.50	82	35.50	42	1.20	82	35.00	0.053
239	-0.23368D+01	-0.24460D+01	12.00	42	1.20	82	35.00	42	0.60	82	34.40	0.033
240	0.10160D+00	-0.74152D-01	12.00	42	0.60	82	34.40	41	59.70	82	33.40	0.021
241	0.53340D+00	0.38592D+00	12.00	41	59.70	82	33.40	41	58.90	82	32.60	0.025
242	-0.10922D+01	-0.12001D+01	12.00	41	58.90	82	32.60	41	58.20	82	32.10	0.031
243	0.25400D+00	0.19813D+00	12.00	41	58.20	82	32.10	41	57.90	82	31.80	0.067
244	0.10160D+00	-0.38786D-01	12.00	41	57.90	82	31.80	41	56.80	82	31.30	0.021
245	0.18034D+01	0.16612D+01	12.00	41	56.80	82	31.30	41	55.70	82	30.80	0.021
246	-0.33782D+01	-0.34975D+01	12.00	41	55.70	82	30.80	41	54.50	82	30.60	0.020
247	0.60813D+01	0.63013D+01	62.00	44	33.80	80	56.80	44	31.00	80	54.80	0.208
248	0.27825D+01	0.31755D+01	62.00	44	31.00	80	54.80	44	27.20	80	53.40	0.165
249	0.87015D+00	0.82024D+00	62.00	44	27.20	80	53.40	44	25.80	80	50.60	0.272
250	0.83574D-01	0.12712D+00	62.00	44	25.80	80	50.60	44	23.40	80	47.40	0.199
251	0.20089D+00	-0.23506D+00	44.00	44	35.00	80	49.70	44	35.50	80	45.40	0.068
252	0.12434D+02	0.11448D+02	44.00	44	35.50	80	45.40	44	37.20	80	36.70	0.033
253	-0.80772D+01	-0.80406D+01	44.00	44	37.20	80	36.70	44	36.50	80	35.90	0.229
254	-0.62138D+01	-0.61841D+01	44.00	44	36.50	80	35.20	44	36.30	80	35.20	1.020
255	0.67056D+01	0.64095D+01	44.00	44	35.30	80	35.20	44	34.60	80	28.70	0.043
256	-0.21475D+00	0.16027D+00	44.00	44	37.60	80	28.70	44	33.90	80	26.60	0.051
257	0.65809D+00	0.57781D+00	44.00	44	33.60	80	27.10	44	32.20	80	23.70	0.075
258	-0.18788D+01	-0.15013D+01	61.00	42	24.50	82	9.80	42	22.10	82	14.90	0.148
259	-0.39624D+01	-0.30062D+01	61.00	42	22.10	82	14.90	42	19.50	82	25.80	0.079
260	-0.65501D+00	-0.12640D+01	53.00	44	11.70	78	46.60	44	14.90	78	44.70	0.137

261	-0.13208D+01	-0.14167D+01	12.00	44	44.80	79	42.00	44	45.30	79	41.90	0.048
262	-0.26416D+01	-0.28695D+01	12.00	44	45.30	79	41.90	44	46.40	79	41.50	0.021
263	-0.14986D+01	-0.15979D+01	12.00	44	46.40	79	41.50	44	47.30	79	42.20	0.024
264	-0.16764D+01	-0.16704D+01	12.00	44	47.30	79	42.20	44	47.80	79	43.30	0.027
265	0.76454D+01	0.75653D+01	12.00	44	47.80	79	43.30	44	48.20	79	43.20	0.060
266	-0.60251D+00	-0.61912D+00	43.00	44	35.20	79	52.10	44	35.20	79	51.90	1.416
267	0.32323D+01	0.31894D+01	43.00	44	35.20	79	51.90	44	36.00	79	52.90	0.185
268	-0.36363D+01	-0.38757D+01	43.00	44	36.00	79	52.90	44	38.60	79	55.00	0.066
269	-0.63795D-01	-0.28525D+00	43.00	44	38.60	79	55.00	44	41.10	79	57.20	0.067
270	0.22801D+01	0.21686D+01	52.00	44	45.00	79	53.20	44	44.80	79	51.50	0.384
271	-0.27901D+01	-0.30729D+01	52.00	44	44.80	79	51.50	44	44.80	79	48.20	0.201
272	0.64477D+01	0.64744D+01	52.00	44	44.80	79	48.20	44	43.50	79	45.90	0.223
273	-0.61839D+01	-0.64400D+01	52.00	44	43.50	79	45.90	44	43.70	79	43.30	0.253
274	-0.10363D+02	-0.10359D+02	8.00	42	57.00	79	14.90	42	56.80	79	14.90	0.054
275	0.99060D+00	0.10139D+01	8.00	42	53.50	79	14.70	42	53.20	79	15.10	0.027
276	-0.14097D+01	-0.14063D+01	8.00	42	53.20	79	15.10	42	53.00	79	15.10	0.054
277	0.80010D+00	0.80341D+00	8.00	42	53.00	79	15.10	42	52.80	79	15.10	0.054
278	-0.22860D+00	-0.22216D+00	8.00	42	52.80	79	15.10	42	52.40	79	15.10	0.027
279	-0.17907D+01	-0.18133D+01	8.00	42	53.50	79	14.70	42	53.50	79	14.20	0.031
280	-0.10135D+02	-0.10322D+02	8.00	42	53.50	79	14.20	42	53.50	79	10.00	0.004
281	0.30861D+01	0.29564D+01	8.00	42	53.50	79	10.00	42	53.00	79	6.80	0.005
282	0.56388D+01	0.55973D+01	8.00	42	53.00	79	6.80	42	52.50	79	5.60	0.011
283	0.20955D+01	0.20639D+01	8.00	42	53.00	79	3.20	42	53.10	79	2.50	0.022
284	-0.10820D+02	-0.11183D+02	8.00	42	53.10	79	0.70	42	57.40	78	54.80	0.002
285	0.16383D+01	0.15138D+01	8.00	42	54.40	78	54.80	42	54.40	78	51.70	0.005
286	-0.14707D+02	-0.14741D+02	8.00	42	54.40	78	54.70	42	55.90	78	54.90	0.007
287	0.22098D+01	0.22093D+01	8.00	42	55.90	78	54.90	42	56.20	78	55.10	0.033
288	0.26670D+00	0.28513D+00	8.00	42	56.20	78	55.10	42	56.70	78	55.90	0.015
289	0.32385D+01	0.32703D+01	8.00	42	56.70	78	55.90	42	56.90	78	56.80	0.017
290	0.41705D+01	0.42371D+01	19.00	49	0.20	88	12.50	49	1.20	88	15.00	0.031
291	0.29905D+01	0.30567D+01	53.00	49	0.20	88	12.50	49	1.20	88	15.00	0.238
292	-0.19436D+01	-0.22779D+01	53.00	48	59.60	88	1.50	49	1.20	88	2.30	0.280
293	-0.40257D+01	-0.42014D+01	53.00	48	58.20	87	59.90	48	59.60	88	1.50	0.266
294	0.35081D+01	0.34981D+01	53.00	48	56.10	87	55.00	48	57.30	87	57.50	0.226
295	0.75625D+01	0.79090D+01	53.00	48	55.40	87	50.80	48	56.10	87	55.00	0.159
296	0.18921D+01	0.20301D+01	53.00	48	54.30	87	43.10	48	55.30	87	46.40	0.191
297	-0.44397D+01	-0.40361D+01	53.00	48	52.30	87	35.40	48	54.30	87	43.10	0.084
298	0.43132D+00	0.10006D+01	53.00	48	50.10	87	25.40	48	50.10	87	29.90	0.153
299	-0.71120D+00	-0.74408D+00	3.00	48	51.40	89	57.70	48	52.00	89	58.30	0.002
300	0.23368D+01	0.22859D+01	3.00	48	50.50	89	56.30	48	51.40	89	57.70	0.001
301	0.40640D+01	0.40584D+01	3.00	48	50.00	89	56.10	48	50.50	89	56.80	0.002
302	-0.17475D+02	-0.17852D+02	3.00	49	57.50	93	23.80	49	58.10	93	21.40	0.001
303	0.29718D+01	0.27739D+01	60.00	48	36.80	93	23.90	48	38.30	93	21.50	0.278
304	-0.24384D+01	-0.21613D+01	3.00	48	37.50	89	53.90	48	36.00	89	53.90	0.001
305	0.10770D+02	0.10750D+02	3.00	48	36.00	89	53.90	48	35.20	89	52.30	0.001
306	-0.36576D+01	-0.34864D+01	5.00	49	24.60	91	38.60	49	24.90	91	39.80	0.005
307	0.20499D+01	0.14362D+01	51.00	50	14.10	90	45.40	50	14.40	90	42.70	0.233
308	0.74706D+00	-0.31361D-02	51.00	50	14.40	90	42.70	50	14.40	90	39.30	0.187
309	0.11748D+01	0.45995D+00	48.00	49	46.10	91	14.10	49	44.20	91	9.60	0.107
310	-0.10130D+01	-0.10231D+01	34.00	48	26.10	89	13.20	48	26.10	89	13.10	2.833
311	0.29852D+01	0.30613D+01	34.00	48	26.10	89	13.20	48	25.80	89	13.30	0.633
312	-0.17302D+01	-0.16962D+01	34.00	48	25.80	89	13.30	48	25.60	89	13.20	0.922
313	-0.51099D+00	-0.43296D+00	34.00	48	25.60	89	13.20	48	25.20	89	13.10	0.480
314	-0.10758D+00	-0.89909D-01	34.00	48	23.60	89	13.90	48	23.70	89	14.30	0.666
315	0.25280D+01	0.25818D+01	34.00	48	23.10	89	14.70	48	22.90	89	14.80	0.922
316	0.10130D+01	0.10569D+01	34.00	48	22.90	89	14.80	48	22.70	89	14.80	0.975
317	0.16316D+01	0.16217D+01	34.00	48	22.70	89	14.80	48	22.70	89	14.70	2.833
318	-0.12931D+00	-0.20754D+01	49.50	48	42.00	80	47.00	48	46.10	80	48.00	0.099
319	-0.29916D+01	-0.21372D+01	54.00	47	58.80	84	50.20	47	57.50	84	53.80	0.176
320	0.56083D+00	0.62076D+00	50.00	49	17.50	81	47.50	49	16.50	81	44.50	0.134
321	-0.25043D+01	-0.22017D+01	37.00	48	15.00	82	26.50	48	14.00	82	25.50	0.100

322	-0.24714D-01	0.40075D-01	37.00	48	15.30	82	27.00	48	15.00	82	26.50	0.506
323	-0.94735D+00	-0.87904D-01	37.00	48	15.30	82	27.00	48	10.00	82	16.00	0.025
324	-0.32622D+01	-0.29020D+01	37.00	48	10.00	82	16.00	48	8.50	82	13.80	0.108
325	0.12604D+01	0.17987D+01	37.00	48	12.00	82	18.50	48	10.00	82	16.00	0.088
326	0.18593D+01	0.20025D+01	50.00	48	28.60	81	19.50	48	28.50	81	19.50	1.405
327	-0.10633D+01	-0.11433D+01	43.00	46	30.70	84	21.50	46	30.80	84	21.00	0.734
328	-0.16625D+01	-0.15809D+01	11.00	46	20.50	83	53.30	46	20.80	83	55.10	0.016
329	-0.15794D+01	0.14353D+01	11.00	46	31.00	84	5.80	46	32.70	84	9.40	0.007
330	-0.45720D+00	-0.37719D+00	10.00	46	30.80	84	21.00	46	30.70	84	21.60	0.040
331	-0.66751D+01	-0.64472D+01	10.00	46	31.20	84	25.40	46	31.20	84	28.00	0.009
332	0.70104D+01	0.71323D+01	10.00	46	31.60	84	32.50	46	31.60	84	33.90	0.018
333	0.63177D+01	0.64275D+01	11.00	46	16.00	83	33.10	46	16.10	83	34.60	0.020
334	-0.83127D-01	-0.20891D+00	11.00	46	16.10	83	34.50	46	17.10	83	36.10	0.014
335	0.72044D+01	0.73672D+01	11.00	46	17.10	83	36.10	46	17.10	83	37.90	0.016
336	-0.83127D+01	-0.81863D+01	11.00	46	17.10	83	37.90	46	17.10	83	39.30	0.021
337	-0.56804D+01	-0.54559D+01	11.00	46	17.10	83	39.30	46	17.00	83	41.50	0.013
338	0.96982D+00	0.99126D+00	11.00	46	17.00	83	41.50	46	17.40	83	42.90	0.020
339	0.40178D+01	0.40929D+01	11.00	46	17.40	83	42.90	46	17.80	83	44.90	0.014
340	-0.71212D+01	-0.70382D+01	11.00	46	17.80	83	44.90	46	18.10	83	46.70	0.016
341	-0.16625D+01	-0.16336D+01	11.00	46	18.00	83	47.50	46	18.30	83	48.70	0.023
342	-0.66502D+01	-0.66374D+01	11.00	46	18.30	83	48.70	46	18.90	83	50.60	0.014
343	-0.67887D+01	-0.67859D+01	11.00	46	18.90	83	50.60	46	19.40	83	52.10	0.018
344	0.19396D+01	0.21575D+01	11.00	46	19.40	83	52.10	46	20.20	83	56.90	0.006
345	-0.16625D+01	-0.14847D+01	11.00	46	20.20	83	56.90	46	20.20	83	58.90	0.015
346	-0.22167D+01	-0.20481D+01	11.00	46	20.20	83	58.90	46	20.20	84	0.80	0.016
347	-0.39901D+01	-0.47725D+01	11.00	46	25.60	84	4.10	46	28.50	84	4.10	0.007
348	-0.89941D-01	-0.17130D+00	61.00	45	19.00	79	59.40	45	20.40	80	1.80	0.290
349	-0.17489D+00	-0.17165D+00	61.00	45	20.40	80	1.80	45	20.60	80	2.30	1.577
350	-0.21486D+00	-0.80945D+00	61.00	45	20.60	80	2.30	45	24.40	80	5.00	0.148
351	0.13991D+01	0.12535D+01	61.00	45	24.40	80	5.00	45	25.80	80	6.80	0.336
352	0.64957D-01	-0.26349D-01	61.00	45	25.80	80	6.80	45	26.30	80	11.80	0.148
353	0.10543D+01	0.10402D+01	61.00	45	28.30	80	11.80	45	29.70	80	15.00	0.240
354	0.20786D+01	0.17202D+01	61.00	45	29.70	80	15.00	45	33.10	80	19.50	0.136
355	-0.19387D+01	-0.22774D+01	61.00	45	33.10	80	19.50	45	35.60	80	22.60	0.182
356	0.95437D+00	0.38639D+00	61.00	45	35.80	80	22.60	45	40.10	80	27.40	0.116
357	-0.22985D+00	-0.75649D+00	61.00	45	40.10	80	27.40	45	43.00	80	29.30	0.197
358	0.11193D+01	0.49100D+00	61.00	45	43.00	80	29.30	45	46.50	80	31.80	0.161
359	0.25983D+00	-0.94594D+00	61.00	45	46.50	80	31.80	45	51.90	80	33.60	0.113
360	0.47969D+00	-0.59578D-01	61.00	45	51.90	80	33.60	45	53.30	80	31.90	0.344
361	0.27482D+00	-0.55600D+00	61.00	45	53.30	80	31.90	45	56.20	80	31.30	0.214
362	-0.41972D+00	-0.16499D+01	61.00	45	56.20	80	31.30	46	2.70	80	36.50	0.085
363	0.60466D+00	0.19857D+00	61.00	46	2.70	80	36.50	46	5.10	80	39.00	0.212
364	-0.12442D+01	-0.16586D+01	61.00	46	5.10	80	39.00	46	7.10	80	40.40	0.283
365	0.12942D+01	0.94974D+00	61.00	46	7.10	80	40.40	46	8.80	80	41.70	0.327
366	-0.14990D-01	-0.98151D+00	61.00	46	8.80	80	41.70	46	13.20	80	44.50	0.131
367	-0.76450D+00	-0.11743D+01	61.00	46	13.20	80	44.50	46	15.30	80	46.40	0.254
368	0.13491D+00	-0.11547D+00	61.00	46	15.30	80	46.50	46	16.30	80	46.90	0.605
369	0.11343D+01	0.57034D+00	61.00	46	16.30	80	46.90	46	18.50	80	47.70	0.277
370	-0.94938D-01	-0.88159D+00	61.00	46	18.50	80	47.70	46	21.10	80	47.60	0.241
371	-0.23485D+00	-0.10379D+01	61.00	46	21.10	80	47.60	46	24.50	80	49.70	0.170
372	0.74645D+00	0.52544D+00	49.00	46	26.70	80	19.90	46	26.20	80	16.50	0.169
373	0.43729D+01	0.42403D+01	49.00	46	25.80	80	13.20	46	25.30	80	10.60	0.218
374	-0.57041D+01	-0.62569D+01	49.00	46	25.30	80	10.60	46	21.90	79	56.10	0.038
375	-0.14854D+02	-0.14962D+02	49.00	46	21.90	79	56.10	46	22.10	79	55.70	1.190
376	-0.82420D+01	-0.92755D+01	49.00	46	21.90	79	56.10	46	22.10	79	47.50	0.068
377	-0.37944D+01	-0.38520D+01	49.00	46	19.50	79	29.90	46	19.00	79	28.00	0.289
378	0.55984D+00	-0.15056D+00	49.00	46	22.10	79	47.50	46	21.30	79	39.00	0.069
379	-0.32346D+01	-0.36979D+01	49.00	46	21.30	79	39.00	46	19.50	79	29.90	0.062
380	0.10160D+01	0.17083D+01	55.50	46	17.00	81	41.60	46	16.90	81	46.50	0.151
381	-0.12631D+01	-0.37943D+00	55.50	46	16.90	81	46.50	46	16.00	81	52.80	0.117
382	-0.10752D+02	-0.92820D+01	55.50	46	16.00	81	52.80	46	14.00	81	53.00	0.127

383	0.98854D+01	0.10566D+02	55.50	46	14.00	91	58.00	46	13.10	82	2.40	0.164
384	0.51624D+01	0.53939D+01	55.50	46	13.10	82	2.40	46	12.90	82	4.20	0.414
385	-0.46406D+01	-0.42966D+01	55.50	46	12.90	82	4.20	46	12.50	82	6.60	0.306
386	0.27075D+01	0.45104D+01	55.50	46	12.50	82	6.60	46	12.30	82	24.60	0.042
387	0.32567D+01	0.50724D+01	55.50	46	12.30	82	24.60	46	11.90	82	42.50	0.042
388	0.33281D+01	0.49279D+01	55.50	46	11.90	82	42.50	46	11.10	82	57.30	0.051
389	-0.57112D+00	-0.66163D+00	54.50	46	30.70	84	19.60	46	30.60	84	19.40	2.944
390	-0.96473D+01	-0.97316D+01	54.50	46	30.60	84	19.40	46	31.30	84	20.60	0.463
391	-0.38100D+01	-0.41405D+01	54.00	46	31.30	84	20.60	46	32.90	84	21.80	0.273
392	0.24666D+01	0.18085D+01	54.00	46	34.60	84	19.40	46	36.30	84	17.30	0.220
393	0.12644D+01	0.63764D+00	54.00	46	36.30	84	17.30	46	38.80	84	18.10	0.192
394	-0.27771D+01	-0.19227D+01	54.00	47	58.80	84	50.20	47	57.50	84	53.80	0.176
395	-0.67377D+00	0.18524D-01	47.50	46	17.60	81	41.60	46	16.90	81	46.50	0.110
396	0.12644D+01	0.63764D+00	54.00	46	36.30	84	17.30	46	38.80	84	18.10	0.192
397	-0.21866D+00	-0.29365D+00	46.00	45	0.50	75	38.30	45	0.80	75	38.50	1.081
398	-0.38895D+01	-0.34936D+01	46.00	45	0.60	75	34.40	45	0.50	75	38.30	0.133
399	-0.18089D+01	-0.11648D+01	46.00	45	3.10	75	26.30	45	2.10	75	29.70	0.140
400	0.72887D+00	0.78605D+00	46.00	45	6.30	75	13.80	45	6.10	75	13.70	1.697
401	0.10270D+01	0.90134D+00	46.00	45	4.90	75	20.70	45	5.40	75	21.10	0.625
402	-0.19878D+00	-0.25489D+00	46.00	45	5.40	75	21.10	45	5.60	75	21.20	1.687
403	-0.80772D+01	-0.80772D+01	4.00	45	2.50	79	20.00	45	2.50	79	20.00	0.050
404	-0.38862D+01	-0.39302D+01	4.00	45	2.50	79	20.00	45	2.80	79	20.20	0.008
405	0.10211D+02	0.10113D+02	2.00	45	6.30	79	20.20	45	6.80	79	20.30	0.001
406	0.21336D+01	0.21939D+01	4.00	45	18.50	79	57.70	45	18.70	79	58.80	0.003
407	-0.98298D+01	-0.98769D+01	4.00	45	18.70	79	58.80	45	19.00	79	59.00	0.008
408	-0.91440D+01	-0.93050D+01	4.00	45	19.00	79	59.00	45	19.90	79	59.40	0.003
409	0.16002D+01	0.15463D+01	4.00	45	19.90	79	59.40	45	20.40	80	0.0	0.004
410	0.69342D+01	0.68160D+01	4.00	45	20.40	80	0.50	45	21.50	80	0.90	0.004
411	-0.32232D+00	0.78370D-01	43.50	45	27.10	80	1.00	45	25.70	80	1.80	0.133
412	-0.88287D+00	-0.53646D+00	43.50	45	25.70	80	1.80	45	24.10	80	1.60	0.124
413	0.49048D-01	0.33043D+00	43.50	45	24.10	80	1.60	45	22.90	80	1.70	0.166
414	0.18358D+01	0.23412D+01	43.50	45	22.90	80	1.70	45	20.60	80	1.60	0.087
415	0.25706D+01	0.25138D+01	41.50	45	51.30	77	12.60	45	51.90	77	13.80	0.178
416	0.89163D+01	0.86336D+01	41.50	45	51.90	77	13.80	45	53.90	77	17.00	0.061
417	0.16232D+01	0.77543D+00	41.50	45	53.90	77	17.00	45	58.50	77	23.00	0.029
418	0.15130D+01	0.13644D+01	41.50	45	58.60	77	23.00	45	59.90	77	25.40	0.086
419	0.62429D+00	0.43531D+00	41.50	45	59.90	77	25.40	46	1.00	77	26.90	0.120
420	-0.70508D+00	-0.73849D+00	41.50	46	1.00	77	26.90	46	1.10	77	26.90	1.815
421	-0.50678D+00	-0.19856D+01	41.50	46	1.10	77	26.90	46	7.40	77	32.30	0.025
422	0.12412D+01	0.10174D+01	41.50	46	7.40	77	32.30	46	8.80	77	34.40	0.090
423	-0.31508D+01	-0.32099D+01	41.50	46	8.80	77	34.40	46	10.00	77	37.30	0.078
424	0.34520D+01	0.35005D+01	41.50	46	10.00	77	37.30	46	10.00	77	37.70	0.659
425	0.72711D+00	0.51573D+00	41.50	46	10.00	77	37.70	46	10.90	77	38.50	0.172
426	-0.25339D+01	-0.25682D+01	41.50	46	11.40	77	41.00	46	11.50	77	41.00	1.815
427	0.32431D+01	0.33369D+01	37.50	44	46.50	79	20.30	44	45.80	79	19.90	0.197
428	-0.12090D+02	-0.12017D+02	3.00	46	18.10	79	24.30	46	18.30	79	25.50	0.002
429	0.38608D+01	0.38951D+01	3.00	46	18.30	79	25.50	46	18.30	79	25.80	0.007
430	0.95504D+01	0.92513D+01	3.00	42	16.30	82	25.80	42	16.60	82	22.70	0.001
431	-0.12192D+01	-0.12387D+01	3.00	42	16.60	82	22.70	42	16.80	82	22.40	0.005
432	0.83820D+01	0.84781D+01	2.00	42	21.50	82	7.80	42	22.10	82	8.50	0.001
433	-0.11278D+02	-0.11283D+02	2.00	42	22.10	82	8.50	42	22.00	82	8.50	0.007
434	-0.50800D+01	-0.51273D+01	9.00	42	59.10	82	24.20	42	59.20	82	23.70	0.038
435	-0.25739D+01	-0.27793D+01	9.00	42	59.20	82	23.70	42	59.20	82	21.50	0.009
436	0.51368D+01	0.45805D+01	34.00	42	57.50	81	37.90	42	55.10	81	31.20	0.038
437	-0.17929D-01	-0.14247D+00	34.00	42	55.10	81	31.20	42	54.50	81	29.70	0.163
438	-0.56478D+00	-0.57282D+00	34.00	42	54.50	81	29.70	42	54.50	81	29.60	2.833
439	0.32512D+01	0.32592D+01	3.00	42	54.50	81	29.60	42	54.50	81	29.70	0.022
440	0.26572D+00	0.29827D+00	39.00	42	46.80	81	11.70	42	46.50	81	12.20	0.562
441	0.26963D+01	0.26069D+01	39.00	42	46.50	81	12.20	42	40.40	81	12.80	0.042
442	0.32886D+00	0.36141D+00	38.00	42	46.80	81	11.70	42	46.50	81	12.20	0.533
443	-0.35560D+01	-0.35442D+01	3.00	42	53.10	80	6.70	42	53.10	80	6.90	0.011

444	0.55880D+01	0.56351D+01	3.00	42	53.10	80	6.90	42	51.90	80	7.70	0.001
445	0.14783D+02	0.14848D+02	2.00	43	10.00	80	15.90	43	10.00	80	16.90	0.001
446	-0.96774D+01	-0.96712D+01	4.00	43	15.40	79	56.10	43	15.40	79	56.20	0.039
447	-0.21539D+01	-0.21488D+01	15.00	43	9.90	79	11.70	43	9.90	79	11.80	0.551
448	-0.34466D+01	-0.34642D+01	13.00	43	21.80	80	59.60	43	22.30	80	58.60	0.057
449	-0.51582D+00	-0.48180D+00	13.00	43	22.30	80	58.60	43	22.40	80	59.10	0.080
450	-0.31652D+01	-0.31688D+01	13.00	43	22.40	80	59.10	43	22.50	80	59.10	0.285
451	-0.58211D+01	-0.54929D+01	51.00	43	24.60	80	39.30	43	22.70	80	42.80	0.143
452	0.17690D+01	0.29483D+01	51.00	43	22.70	80	42.30	43	22.30	80	58.60	0.040
453	0.10220D+01	0.10396D+01	51.00	43	22.30	80	58.60	43	21.80	80	58.60	0.877
454	0.63500D-02	-0.28475D-01	48.00	43	26.40	80	29.50	43	27.30	80	29.60	0.430
455	-0.14605D+00	-0.56440D-01	48.00	43	27.30	80	29.60	43	28.10	80	31.40	0.263
456	-0.12764D+01	-0.12762D+01	48.00	43	28.10	80	31.40	43	27.80	80	31.20	1.177
457	0.19771D+00	0.18329D+00	37.00	43	26.70	80	29.90	43	26.40	80	29.50	0.567
458	-0.15240D+02	-0.15297D+02	1.00	43	28.10	80	31.40	43	28.40	80	30.80	0.000
459	-0.70104D+01	-0.70169D+01	1.00	43	29.20	80	31.50	43	29.90	80	31.90	0.000
460	-0.16764D+02	-0.16744D+02	1.00	43	37.50	80	8.50	43	37.30	80	8.60	0.001
461	0.0	0.17002D-01	4.00	43	29.70	80	25.70	43	28.50	80	25.80	0.013
462	-0.29718D+01	-0.29528D+01	4.00	43	29.50	80	25.80	43	28.40	80	26.00	0.016
463	0.0	0.26043D-01	4.00	43	28.40	80	26.00	43	28.30	80	26.30	0.012
464	0.0	0.14075D-01	4.00	43	28.30	80	26.30	43	28.30	80	26.50	0.020
465	-0.45720D+00	-0.37912D+00	4.00	43	28.30	80	26.50	43	28.00	80	27.40	0.004
466	-0.38100D+00	-0.34570D+00	4.00	43	27.60	80	28.00	43	27.80	80	28.50	0.008
467	0.0	-0.25350D-02	4.00	43	27.60	80	28.50	43	27.80	80	28.60	0.013
468	-0.20683D+01	-0.20480D+01	14.00	43	37.50	80	8.50	43	37.30	80	8.60	0.156
469	-0.69233D+01	-0.67006D+01	14.00	43	37.30	80	8.60	43	35.80	80	10.40	0.017
470	-0.45938D+01	-0.43960D+01	14.00	43	35.80	80	10.40	43	34.30	80	11.90	0.018
471	0.40930D+01	0.44013D+01	14.00	43	34.30	80	11.90	43	32.50	80	14.80	0.012
472	-0.75184D+01	-0.74054D+01	3.00	43	49.80	80	32.00	43	49.80	80	33.50	0.001
473	0.12023D+01	0.11840D+01	18.00	43	58.80	80	44.30	43	59.00	80	44.30	0.273
474	-0.10886D-01	0.25428D-01	56.00	43	42.30	80	22.80	43	42.70	80	23.70	1.537
475	0.80010D+01	0.80010D+01	4.00	43	17.90	79	47.80	43	17.90	79	47.80	0.050
476	0.14859D+02	0.14866D+02	4.00	43	17.90	79	47.80	43	17.30	79	47.50	0.004
477	0.11430D+02	0.11419D+02	4.00	43	17.30	79	47.50	43	16.70	79	46.90	0.004
478	0.38100D+01	0.38160D+01	4.00	43	16.70	79	46.90	43	15.80	79	46.40	0.003
479	-0.58347D+01	-0.58081D+01	7.00	43	5.30	72	56.80	43	4.60	79	57.00	0.012
480	-0.45285D+01	-0.45146D+01	7.00	43	4.60	79	57.00	43	4.50	79	57.20	0.049
481	0.15240D+01	0.15586D+01	9.00	43	15.50	79	54.80	43	15.40	79	55.30	0.038
482	-0.19543D+01	-0.22490D+01	17.00	44	30.70	80	55.20	44	33.80	80	56.80	0.009
483	0.15240D+01	0.15325D+01	1.00	44	33.80	80	56.80	44	33.80	80	56.90	0.002
484	0.32512D+00	0.33358D+00	45.00	44	33.80	80	56.80	44	33.80	80	56.90	3.101
485	0.56444D-01	0.79676D-01	27.00	43	50.20	80	50.90	43	50.00	80	51.00	0.581
486	0.73378D+00	0.69500D+00	27.00	43	50.00	80	51.00	43	50.40	80	50.90	0.303
487	0.25400D+01	0.28785D+01	27.00	43	50.40	80	50.90	43	48.40	80	53.30	0.047
488	0.92082D+01	0.10042D+02	38.00	42	1.70	82	36.20	42	2.30	82	43.30	0.049
489	0.36897D+00	0.49809D+00	38.00	42	2.30	82	43.30	42	2.20	82	44.50	0.293
490	-0.11470D+01	-0.10743D+01	38.00	42	16.80	83	1.10	42	17.70	83	1.40	0.264
491	0.16256D+01	0.16356D+01	3.00	42	24.40	82	10.90	42	24.20	82	11.10	0.006
492	-0.30480D+00	-0.30522D+00	3.00	42	24.20	82	11.10	42	24.40	82	11.00	0.007
493	-0.63190D+00	-0.63455D+00	41.00	42	40.50	81	12.80	42	40.40	81	12.80	2.835
494	-0.11009D+02	-0.10898D+02	8.50	44	5.80	81	17.90	44	5.50	81	18.80	0.016
495	-0.22167D+00	-0.23351D+00	11.00	44	15.70	80	33.00	44	15.80	80	33.00	0.204
496	-0.61976D+01	-0.61903D+01	3.00	43	55.30	80	5.60	43	55.30	80	5.70	0.022
497	0.46736D+01	0.46863D+01	3.00	43	55.30	80	5.70	43	55.40	80	6.00	0.007
498	0.0	0.97899D-01	11.00	46	18.10	83	46.70	46	18.00	83	47.50	0.036
499	0.24384D+01	0.25183D+01	1.00	44	1.00	79	40.00	44	0.80	79	40.80	0.000
500	0.18390D+01	0.17118D+01	60.00	43	50.30	79	42.00	43	51.80	79	42.20	0.403
501	-0.46736D+01	-0.47129D+01	6.00	43	41.30	79	46.30	43	41.80	79	46.30	0.012
502	-0.74168D+01	-0.73887D+01	6.00	43	41.80	79	46.30	43	42.30	79	47.30	0.007
503	-0.98323D+01	-0.99477D+01	31.00	44	4.30	79	28.90	44	5.70	79	29.60	0.069
504	0.80865D+00	0.56443D+00	49.00	44	1.40	79	48.30	44	3.70	79	43.40	0.176

505	0.32657D+00	0.38486D+00	42.00	44	36.70	79	24.80	44	36.50	79	25.10	1.075
506	-0.12005D+01	-0.27042D+01	49.00	44	43.60	79	36.70	44	51.90	79	36.00	0.051
507	0.22082D+01	0.17741D+01	49.00	44	51.80	79	36.00	44	54.20	79	36.20	0.169
508	-0.22497D+01	-0.20581D+01	42.00	43	44.00	79	19.60	43	42.80	79	20.90	0.199
509	-0.43906D+01	-0.43779D+01	42.00	43	42.80	79	20.90	43	42.00	79	20.00	0.294
510	0.70394D+01	0.73672D+01	42.00	43	42.00	79	20.00	43	40.80	79	23.50	0.111
511	-0.40640D+00	-0.49555D+00	6.00	43	40.00	79	28.30	43	41.00	79	28.20	0.006
512	-0.74894D+01	-0.75569D+01	3.50	44	1.00	79	35.50	44	1.80	79	35.80	0.003
513	-0.64443D+01	-0.65086D+01	3.50	44	1.80	79	35.80	44	2.50	79	36.00	0.003
514	0.99753D+00	0.10775D+01	11.00	44	3.50	79	27.70	44	3.00	79	28.00	0.038
515	0.26324D+01	0.25686D+01	11.00	44	3.00	79	28.00	44	3.30	79	27.60	0.050
516	-0.78334D+01	-0.74550D+01	10.00	44	23.40	79	6.60	44	20.30	79	5.40	0.005
517	0.66142D+01	0.64699D+01	10.00	44	20.30	79	5.40	44	20.70	79	4.30	0.020
518	-0.16429D+01	-0.17566D+01	41.00	44	29.30	79	9.00	44	30.00	79	9.00	0.253
519	0.85047D+01	0.82567D+01	41.00	44	30.00	79	9.00	44	32.00	79	10.00	0.084
520	0.24267D+01	0.24234D+01	52.00	44	32.00	79	10.00	44	35.00	79	16.10	0.088
521	0.32431D+01	0.33003D+01	37.50	44	46.50	79	20.30	44	46.00	79	19.90	0.260
522	0.48006D+01	0.47797D+01	8.00	44	18.30	77	57.30	44	18.50	77	57.50	0.044
523	0.60158D+01	0.56141D+01	38.00	43	58.80	78	37.00	44	1.80	78	36.90	0.051
524	-0.59516D+01	-0.62022D+01	38.00	44	1.80	78	36.90	44	4.00	78	37.60	0.068
525	0.62702D+01	0.61420D+01	7.00	44	22.80	77	59.00	44	23.30	77	58.50	0.014
526	-0.18838D+00	0.72637D+00	50.00	44	25.90	77	53.80	44	23.10	77	59.10	0.092
527	-0.10485D+01	-0.75139D+00	50.00	44	23.10	77	59.10	44	22.40	78	1.40	0.244
528	-0.84526D+01	-0.85037D+01	41.00	44	18.50	79	5.00	44	19.00	79	5.30	0.328
529	-0.17099D+00	-0.13601D+00	41.00	44	15.90	79	4.30	44	15.50	79	4.00	0.394
530	0.91143D+01	0.94542D+01	41.00	44	15.50	79	4.00	44	12.20	79	2.30	0.051
531	-0.73970D+01	-0.70535D+01	41.00	44	12.20	79	2.30	44	9.00	79	1.00	0.053
532	0.74397D+01	0.82130D+01	41.00	44	2.00	79	1.00	44	5.30	78	59.80	0.063
533	-0.16561D+02	-0.16654D+02	3.00	44	16.90	78	42.20	44	17.60	78	42.40	0.002
534	0.67056D+01	0.65160D+01	3.00	44	17.60	78	42.40	44	19.20	78	43.20	0.001
535	0.19304D+01	0.18346D+01	3.00	44	19.20	78	43.20	44	20.30	78	43.60	0.002
536	-0.52832D+01	-0.53872D+01	3.00	44	20.00	78	43.60	44	20.80	78	43.90	0.002
537	-0.13919D+02	-0.13937D+02	3.00	44	20.80	78	43.90	44	21.20	78	44.50	0.003
538	-0.38629D+01	-0.44068D+01	49.00	44	39.50	78	47.90	44	42.50	78	48.10	0.135
539	0.18848D+01	0.17098D+01	49.00	44	42.50	78	48.10	44	43.60	78	48.50	0.357
540	-0.30169D+01	-0.35779D+01	49.00	44	43.60	78	48.50	44	46.60	78	48.70	0.135
541	-0.16111D+01	-0.24279D+01	49.00	44	46.60	78	48.70	44	48.30	78	43.10	0.096
542	0.77133D+00	0.89195D+00	49.00	44	48.30	78	43.10	44	49.30	78	46.80	0.148
543	0.12845D+01	0.11478D+01	14.00	44	31.30	78	46.40	44	32.50	78	47.30	0.024
544	-0.15240D+01	-0.15940D+01	14.00	44	32.50	78	47.30	44	32.90	78	47.30	0.083
545	-0.12878D+01	-0.13055D+01	40.00	44	25.20	78	16.40	44	25.30	78	16.40	1.686
546	0.28448D+01	0.23342D+01	30.00	44	32.30	78	32.70	44	34.40	78	31.10	0.040
547	0.63190D+00	0.27623D+00	41.00	44	30.20	78	44.50	44	32.20	78	44.40	0.142
548	0.11151D+01	0.10896D+01	41.00	44	32.20	78	44.40	44	32.30	78	44.30	2.335
549	0.20955D+01	0.21181D+01	8.00	44	26.00	77	53.50	44	26.00	77	53.80	0.052
550	-0.48387D+01	-0.47633D+01	8.00	44	26.00	77	53.80	44	25.80	77	54.30	0.027
551	0.10488D+02	0.10785D+02	49.00	44	23.10	77	59.10	44	22.40	78	1.40	0.234
552	0.83820D+01	0.85706D+01	2.00	44	33.30	77	19.30	44	32.50	77	19.50	0.001
553	0.25831D-01	0.27232D-01	59.00	44	54.20	76	15.40	44	54.10	76	15.10	2.559
554	0.20664D+00	0.14161D+01	59.00	44	54.10	76	15.10	44	52.20	76	22.80	0.104
555	0.28930D+00	0.79787D+00	59.00	44	52.20	76	22.80	44	51.30	76	25.80	0.261
556	-0.26709D+01	-0.25132D+01	59.00	44	43.00	76	53.60	44	43.10	76	55.80	0.387
557	0.45462D+00	0.83957D+00	59.00	44	43.10	76	55.80	44	42.50	76	58.70	0.282
558	0.45443D+01	0.44066D+01	11.00	44	38.80	77	7.50	44	39.50	77	7.80	0.028
559	0.30488D+00	0.34698D+00	5.00	44	28.70	77	18.70	44	28.50	77	18.70	0.021
560	0.38481D+01	0.40303D+01	8.00	44	33.30	78	13.10	44	32.80	78	14.20	0.012
561	0.64770D+00	0.63977D+00	8.00	44	32.80	78	14.20	44	32.80	78	14.10	0.157
562	-0.38100D-01	-0.57010D-01	8.00	44	32.80	78	14.10	44	32.90	78	14.10	0.108
563	0.27432D+01	0.29473D+01	8.00	44	19.00	78	18.90	44	18.30	78	20.10	0.010
564	-0.15773D+02	-0.15952D+02	8.00	44	19.30	78	20.10	44	21.20	78	22.00	0.005
565	0.16764D+01	0.16941D+01	8.00	44	25.30	78	16.40	44	25.20	78	16.40	0.108

566	-0.205740+01	-0.189130+01	8.00	44	25.20	78	16.40	44	24.00	78	15.80	0.009
567	0.506730+01	0.507050+01	8.00	44	33.50	78	12.50	44	33.40	78	12.30	0.063
568	-0.529590+01	-0.532610+01	8.00	44	33.40	78	12.30	44	33.60	78	12.40	0.051
569	-0.472440+01	-0.472730+01	8.00	44	33.60	78	12.40	44	34.20	78	13.60	0.010
570	-0.472440+01	-0.462030+01	8.00	44	33.80	78	20.40	44	33.50	78	21.00	0.021
571	0.579120+01	0.580460+01	8.00	44	33.50	78	21.00	44	33.30	78	20.70	0.038
572	0.148590+01	0.135800+01	8.00	44	15.90	77	47.60	44	16.50	77	47.30	0.017
573	-0.637820+00	-0.124620+01	54.00	44	11.70	78	46.60	44	14.90	78	44.70	0.142
574	-0.461720+01	-0.455750+01	54.00	44	21.10	78	43.50	44	21.20	78	44.50	0.707
575	-0.218440+01	-0.219260+01	12.00	44	35.80	78	56.30	44	35.80	78	56.20	0.353
576	0.878840+01	0.883180+01	12.00	44	35.80	78	56.20	44	35.60	78	56.30	0.115
577	-0.473830+01	-0.485330+01	11.00	44	46.20	79	21.00	44	46.50	79	20.30	0.036
578	0.667790+01	0.692280+01	11.00	44	46.50	79	20.30	44	46.10	79	22.30	0.014
579	-0.332510+00	-0.340970+00	44.00	44	33.80	80	56.90	44	33.80	80	56.80	2.965
580	-0.914400+00	-0.748370+00	13.00	42	26.70	82	14.10	42	27.70	82	15.40	0.021
581	-0.324740+00	-0.739120+00	13.00	42	27.70	82	15.40	42	29.30	82	17.30	0.014
582	-0.150060+02	-0.148690+02	13.00	42	29.30	82	17.30	42	30.10	82	18.40	0.026
583	0.111510+02	0.115660+02	12.00	42	2.20	82	45.30	42	1.20	82	49.50	0.008
584	-0.904240+01	-0.906940+01	12.00	42	1.20	82	49.50	42	0.80	82	49.50	0.061
585	0.457200+00	-0.874810-01	44.00	44	40.80	81	8.10	44	44.50	81	8.30	0.055
586	0.172490+01	0.171200+01	44.00	45	10.40	81	31.10	45	12.70	81	35.80	0.051
587	0.574960+00	-0.196320+00	44.00	44	33.80	80	56.80	44	35.00	80	49.70	0.041
588	-0.263240+00	-0.160750+00	44.00	44	33.90	80	26.60	44	33.60	80	27.30	0.360
589	0.228600+00	0.211860+00	44.00	44	33.60	80	27.30	44	33.60	80	27.10	1.482
590	-0.177880+01	-0.112760+01	61.00	42	19.50	82	25.80	42	18.30	82	32.70	0.128
591	-0.255890+01	-0.481440+01	43.00	44	28.00	80	6.40	44	35.20	79	52.10	0.016
592	-0.135390+01	-0.234980+01	43.00	44	41.10	79	57.20	44	45.30	79	53.80	0.041
593	-0.496190+00	-0.461790+00	43.00	44	45.30	79	53.30	44	46.20	79	56.00	0.111
594	-0.140350+01	-0.140360+01	43.00	44	45.30	79	53.80	44	45.00	79	53.20	0.382
595	0.487680+00	0.289370-01	10.00	44	42.60	79	38.70	44	42.70	79	33.50	0.005
596	-0.132520+01	-0.131570+01	11.50	46	30.50	84	19.70	46	30.40	84	19.50	0.131
597	-0.503560+01	-0.497940+01	11.50	46	16.90	83	32.90	46	17.10	83	34.10	0.026
598	-0.582200+00	-0.525740+00	44.50	46	16.90	83	32.90	46	17.10	83	34.10	0.393
599	0.702070+01	0.791200+01	44.50	46	16.90	83	32.90	46	20.50	83	53.30	0.023
600	0.825730+01	0.978420+01	11.00	46	32.70	84	9.40	46	30.40	84	19.50	0.003
601	0.108500+02	0.111830+02	54.50	46	31.60	84	20.60	46	30.70	84	21.60	0.442
602	-0.541870+01	-0.532710+01	9.00	46	28.40	80	51.70	46	28.70	80	53.40	0.011
603	-0.111760+02	-0.113500+02	9.00	46	29.30	80	59.60	46	30.00	81	0.0	0.018
604	0.510750+01	0.436930+01	37.00	46	19.70	79	22.10	46	21.20	79	19.90	0.108
605	0.354230+01	0.216650+01	37.00	46	21.20	79	19.90	46	25.40	79	19.90	0.055
606	0.572530+01	0.539740+01	37.00	46	25.40	79	19.90	46	27.20	79	22.20	0.096
607	0.201830+01	0.157170+01	37.00	46	27.20	79	22.20	46	29.10	79	23.80	0.105
608	-0.115330+01	-0.137810+01	37.00	46	29.10	79	23.80	46	29.70	79	23.60	0.375
609	0.107090+01	0.551350+00	37.00	46	29.70	79	23.60	46	31.80	79	25.20	0.097
610	-0.266700+01	-0.297120+01	36.00	47	30.40	79	41.20	47	30.90	79	40.50	0.315
611	-0.123570+00	-0.442320-01	37.00	46	19.00	79	28.00	46	18.50	79	27.30	0.332
612	0.243020+01	0.962150+00	37.00	46	58.10	79	44.40	47	3.10	79	47.70	0.042
613	0.160640+01	-0.586090+00	37.00	47	3.10	79	47.70	47	8.30	79	46.10	0.043
614	-0.370700+00	-0.247180+01	37.00	47	8.30	79	46.10	47	12.70	79	43.10	0.047
615	-0.914400+01	-0.861410+01	7.00	45	31.20	77	56.30	45	30.20	77	58.70	0.004
616	-0.653140+01	-0.570720+01	7.00	45	33.30	77	54.10	45	31.20	77	56.30	0.003
617	-0.391890+01	-0.349040+01	7.00	45	33.80	77	51.40	45	33.30	77	54.10	0.004
618	0.104500+02	0.104430+02	7.00	45	32.70	77	48.50	45	33.80	77	51.40	0.004
619	-0.631370+01	-0.638910+01	7.00	45	31.40	77	45.70	45	32.70	77	48.50	0.004
620	0.653140+00	0.562180+00	7.00	45	30.60	77	44.40	45	31.40	77	45.70	0.007
621	0.268940+00	0.247490+00	17.00	45	28.30	76	41.00	45	28.30	76	40.80	0.354
622	-0.409580+01	-0.391310+01	16.00	45	32.80	78	33.80	45	33.70	78	37.90	0.015
623	0.398580+01	0.316950+01	13.00	45	25.20	75	43.80	45	27.90	75	44.70	0.010
624	0.159430+02	0.158460+02	13.00	45	24.90	75	39.70	45	24.90	75	38.80	0.046
625	0.117230+00	0.957540+00	13.00	45	24.90	75	38.80	45	23.50	75	42.20	0.010
626	0.261260+01	0.267190+01	7.00	45	36.00	74	35.30	45	36.00	74	36.30	0.024

627	-0.65314D+00	-0.65314D+00	7.00	45	36.60	74	36.30	45	36.60	74	36.30	0.153
628	-0.10886J+01	-0.10259D+01	7.00	45	36.60	74	36.30	45	36.50	74	36.50	0.049
629	-0.19594D+01	-0.19120D+01	7.00	45	36.50	74	36.50	45	36.50	74	36.90	0.030
630	0.75329D+01	0.79301D+01	7.00	45	36.50	74	36.90	45	35.60	74	37.30	0.009
631	0.0	0.98448D-01	58.00	45	5.60	75	37.30	45	5.20	75	37.00	1.260
632	-0.84667D+00	-0.80507D+00	36.00	45	23.50	75	42.20	45	23.60	75	42.90	0.444
633	-0.45720D+01	-0.46070D+01	1.00	49	47.80	84	6.50	49	47.80	84	6.30	0.001
634	0.83820J+01	0.81601D+01	4.00	49	41.70	83	41.20	49	41.70	83	39.90	0.003
635	0.16764D+02	0.16829D+02	1.00	47	41.20	83	7.20	47	41.30	83	8.10	0.000
636	-0.24260D+00	-0.25724D+00	49.00	49	45.50	83	58.20	49	43.70	83	52.90	0.100
637	0.32160D+01	0.25370D+01	49.00	49	43.00	83	48.30	49	41.50	83	39.90	0.068
638	0.0	-0.10009D+00	42.00	44	42.60	75	31.00	44	42.80	75	30.50	0.747
639	0.50800J+00	0.44042D+00	42.00	44	42.60	75	30.60	44	42.80	75	30.50	1.406
640	-0.13063D+01	-0.12900D+01	42.00	44	42.60	75	30.60	44	42.60	75	30.80	2.161
641	0.21771D+00	0.30321D+00	42.00	44	13.80	76	29.00	44	13.50	76	29.30	0.817
642	-0.97971D+00	-0.96346D+00	14.00	44	42.60	75	30.60	44	42.60	75	30.80	0.240
643	0.38100D+01	0.37424D+01	14.00	44	42.60	75	30.60	44	42.80	75	30.50	0.156
644	0.87086D+00	0.90337D+00	14.00	44	42.60	75	30.60	44	42.60	75	31.00	0.120
645	-0.18506D+01	-0.18668D+01	14.00	44	42.60	75	31.00	44	42.60	75	30.80	0.240
646	0.47625D+00	0.44596D+00	16.00	45	8.30	76	8.60	45	8.40	76	8.60	0.432
647	-0.18288J+02	-0.17597D+02	2.00	44	22.40	78	1.40	44	21.00	78	7.40	0.000
648	-0.93133D+01	-0.91407D+01	9.00	44	18.50	78	19.20	44	17.50	78	19.30	0.014
649	-0.50800D+00	-0.41706D+00	9.00	44	17.50	78	19.30	44	17.30	78	20.10	0.023
650	0.10352D+01	0.17738D+01	53.00	45	30.90	75	32.70	45	30.00	75	36.50	0.171
651	-0.50800D+00	-0.50800D+00	12.00	45	33.50	75	25.30	45	33.50	75	25.30	0.459
652	-0.16510D+01	-0.15586D+01	12.00	45	32.70	75	25.50	45	32.60	75	26.00	0.068
653	-0.10015D+02	-0.99199D+01	7.00	45	35.30	75	24.80	45	35.10	75	25.00	0.034
654	0.32657D+01	0.32528D+01	7.00	45	35.30	75	24.80	45	35.40	75	25.00	0.049
655	-0.60960D-01	-0.35218D+00	10.00	45	36.00	75	25.20	45	37.00	75	25.80	0.016
656	-0.57291D+01	-0.50339D+01	54.00	45	36.30	75	10.40	45	35.80	75	14.80	0.160
657	0.24271D+01	0.25903D+01	54.00	45	36.30	75	9.00	45	36.30	75	10.40	0.510
658	0.45156J+00	0.50781D+00	54.00	45	36.20	75	8.20	45	36.30	75	9.00	0.879
659	0.42333D+00	0.12098D+01	54.00	45	36.90	75	3.70	45	36.20	75	8.20	0.155
660	-0.60960D+00	-0.65362D+00	20.00	45	43.90	76	51.40	45	44.00	76	51.30	0.556
661	-0.15240D+01	-0.14621D+01	20.00	45	44.00	76	51.30	45	43.60	76	50.70	0.117
662	-0.56606D+01	-0.53372D+01	7.00	45	31.00	78	11.40	45	30.50	78	13.20	0.006
663	0.13498D+02	0.13600D+02	7.00	45	30.50	78	9.10	45	31.00	78	11.40	0.005
664	0.11757D+02	0.11762D+02	7.00	45	29.50	78	6.40	45	30.50	78	9.10	0.004
665	-0.60960D+01	-0.52669D+01	7.00	45	31.30	78	3.20	45	29.50	78	6.40	0.003
666	0.28303D+01	0.28932D+01	7.00	45	30.70	78	1.00	45	31.30	78	3.20	0.005
667	-0.10886D+01	-0.97036D+00	7.00	45	30.30	77	58.80	45	30.70	78	1.00	0.005
668	0.34834D+01	0.34661D+01	7.00	45	30.20	77	58.70	45	30.30	77	58.80	0.068
669	-0.17929D+01	-0.17929D+01	17.00	48	36.70	93	24.10	48	36.70	93	24.10	0.903
670	-0.60655D+01	-0.64369D+01	50.00	48	43.50	94	32.00	48	43.40	94	28.10	0.157
671	0.11084D+01	0.11286D+01	22.00	48	26.10	89	13.20	48	26.10	89	13.40	0.593
672	-0.277C9D+00	-0.23315D+00	22.00	48	23.10	89	14.70	48	22.90	89	14.70	0.408
673	0.15957D+02	0.16496D+02	17.00	49	2.10	95	38.50	49	2.10	95	43.30	0.015
674	-0.45720D+01	-0.46070D+01	1.00	49	47.80	84	6.50	49	47.80	84	6.30	0.001
675	0.12192D+02	0.12175D+02	1.00	48	6.60	75	11.80	48	6.60	75	11.70	0.002
676	0.10523D+01	0.35298D+01	42.00	46	46.10	72	30.20	46	42.80	72	35.10	0.063
677	-0.44994D+00	0.23600D+01	42.00	46	42.80	72	35.10	46	38.40	72	38.80	0.059
678	-0.92990D+00	-0.17723D+01	59.00	48	39.50	90	29.50	48	40.00	90	22.30	0.118
679	0.26416D+01	0.26416D+01	3.00	49	0.80	88	15.60	49	0.80	88	15.60	0.028
680	0.56896D+01	0.55044D+01	3.00	49	0.80	88	15.60	49	1.20	88	15.00	0.003
681	0.23725D+01	0.19618D+01	37.00	49	17.00	88	6.60	49	18.50	88	6.60	0.154
682	-0.19771D+00	-0.10443D+01	37.00	49	18.50	88	6.60	49	22.20	88	7.70	0.061
683	0.31304D+00	0.26867D+00	37.00	49	40.20	87	29.00	49	41.10	87	30.40	0.175
684	0.21913D+01	0.24689D+01	37.00	49	41.10	87	30.40	49	41.20	87	32.20	0.186
685	0.26126D+01	0.23963D+01	14.00	50	10.70	86	42.80	50	10.00	86	40.40	0.018
686	0.20012D+01	-0.49640D+00	49.50	48	24.10	80	18.70	48	32.00	80	24.40	0.040
687	0.21305D+01	0.35721D+00	49.50	48	14.10	80	15.00	48	17.50	80	14.00	0.117

688	0.34766D+01	0.22951D+01	32.00	49	45.00	81	31.90	49	47.20	81	32.50	0.077
689	-0.37148D+01	-0.38936D+01	32.00	49	47.20	81	32.50	49	47.80	81	33.50	0.199
690	-0.18478D+01	-0.20334D+01	32.00	49	47.80	81	33.50	49	48.50	81	34.80	0.152
691	-0.10886D+01	-0.11506D+01	7.00	49	3.70	81	1.50	49	3.70	81	1.10	0.030
692	0.25815D+01	0.25669D+01	49.00	48	28.50	80	21.80	48	28.50	80	21.70	5.883
693	0.24630D-01	0.77523D+00	49.50	48	33.50	80	32.40	48	29.50	80	23.90	0.058
694	0.45720D+01	0.42538D+01	1.00	48	5.30	82	6.20	48	5.20	82	3.40	0.000
695	-0.19594D+01	-0.20013D+01	7.00	48	5.90	80	3.60	48	6.20	80	4.30	0.015
696	-0.74023D+01	-0.72751D+01	7.00	48	6.20	80	4.30	48	6.50	80	6.20	0.006
697	-0.33833D+01	-0.22176D+01	60.00	45	32.50	77	27.50	45	30.60	77	33.80	0.130
698	0.58615D+00	0.73395D+00	13.00	46	19.00	79	28.00	46	18.50	79	27.90	0.056
699	0.41031D+01	0.41824D+01	13.00	46	19.00	79	28.00	46	18.50	79	27.30	0.041
700	0.29308D+01	0.20716D+01	13.00	46	16.10	79	11.60	46	16.30	79	4.70	0.006
701	0.94488D+01	0.99284D+01	13.00	46	16.10	79	0.0	46	16.30	79	4.70	0.009
702	-0.58615D+00	-0.45287D+00	13.00	46	16.90	78	53.30	46	17.10	78	55.00	0.024
703	-0.35169D+00	-0.11809D+01	13.00	46	16.90	78	53.30	46	17.50	78	47.90	0.008
704	0.42203D+00	0.12999D+00	13.00	46	18.50	78	42.70	46	19.20	78	42.20	0.037
705	0.27709D+01	0.34838D+01	22.00	45	3.00	75	41.30	45	1.50	75	43.00	0.035
706	0.85621D+01	0.86812D+01	22.00	45	1.50	75	43.90	45	0.30	75	41.20	0.037
707	-0.18704D+01	-0.89264D+00	22.00	45	0.30	75	41.20	44	58.90	75	47.10	0.019
708	0.25631D+01	0.26028D+01	22.00	44	58.90	75	47.10	44	58.80	75	47.20	0.672
709	0.94343D+00	0.70084D+00	21.00	45	15.40	75	21.40	45	15.90	75	20.70	0.107
710	-0.52977D+01	-0.55155D+01	21.00	45	15.90	75	20.70	45	15.90	75	18.60	0.051
711	0.22860D+01	0.25663D+01	16.00	45	14.30	75	2.60	45	14.00	75	4.30	0.036
712	-0.11144D+02	-0.10705D+02	16.00	45	7.50	75	8.00	45	6.90	75	10.40	0.025
713	0.44768D+01	0.50815D+01	16.00	45	20.00	74	53.40	45	18.80	74	55.00	0.027
714	-0.99881D+01	-0.10009D+02	52.00	45	26.10	76	21.30	45	26.10	76	21.10	3.313
715	-0.93902D+01	-0.88631D+01	52.00	45	26.10	76	21.10	45	26.10	76	27.50	0.103
716	-0.46072D+01	-0.41251D+01	52.00	45	26.60	76	27.50	45	26.70	76	32.30	0.138
717	-0.26709D+01	-0.24806D+01	59.00	44	43.00	76	53.50	44	43.00	76	55.80	0.371
718	0.45978D+00	0.84517D+00	59.00	44	43.00	76	55.30	44	42.50	76	53.00	0.260
719	-0.19011D+01	-0.24669D+01	59.00	44	46.30	76	41.50	44	48.50	76	41.50	0.267
720	-0.69226D+00	-0.15625D+00	59.00	44	52.30	76	22.80	44	51.30	76	25.80	0.256
721	0.12967D+01	0.24773D+01	59.00	44	54.00	76	14.80	44	52.30	76	22.80	0.102
722	-0.10973D+02	-0.11035D+02	3.00	49	5.80	90	42.50	49	7.10	90	43.20	0.001
723	0.50800D+01	0.52964D+01	3.00	48	58.90	90	21.60	49	0.70	90	25.40	0.000
724	-0.63441D+01	-0.68694D+01	44.00	44	10.60	81	38.60	44	10.00	81	38.30	0.988
725	0.37279D+01	0.36970D+01	13.00	43	7.10	81	59.10	43	9.30	81	59.10	0.013
726	0.14062D+01	0.13821D+01	44.00	44	44.50	81	8.30	44	44.60	81	8.20	1.681
727	-0.13716D+01	-0.16739D+01	44.00	44	44.60	81	8.20	44	49.00	81	12.70	0.038
728	0.19396D+00	0.13480D+00	44.00	44	36.50	80	35.90	44	36.50	80	35.20	0.424
729	-0.73152D+00	-0.10573D+01	10.00	44	43.70	79	43.30	44	44.30	79	40.70	0.009
730	-0.71628D+01	-0.72747D+01	8.00	42	52.50	79	5.60	42	53.00	79	3.20	0.006
731	0.19050D+00	0.11530D+00	8.00	42	53.10	79	2.50	42	53.10	79	0.70	0.009
732	0.86360D+01	0.86293D+01	3.00	48	49.30	89	55.10	48	50.00	89	56.10	0.002
733	-0.17392D+01	-0.14889D+01	34.00	48	25.60	89	13.20	48	24.60	89	13.50	0.191
734	0.32143D+01	0.14280D+01	11.00	46	20.80	83	55.10	46	31.00	84	5.80	0.002
735	0.13106D+02	0.13391D+02	10.00	46	31.20	84	28.00	46	31.60	84	32.50	0.005
736	0.20782D+02	0.19642D+02	11.00	46	20.20	84	0.80	46	25.60	84	4.10	0.003
737	-0.99391D+00	0.83506D-01	46.00	45	6.10	75	13.70	45	4.90	75	20.70	0.072
738	0.25265D+01	0.26588D+01	41.50	46	10.90	77	38.50	46	11.40	77	41.00	0.101
739	-0.19050D+01	-0.18787D+01	4.00	43	17.80	79	4.30	43	17.80	79	4.80	0.008
740	0.10278D+01	0.10401D+01	43.00	43	44.50	81	42.50	43	52.30	81	49.20	0.034
741	0.45720D+00	0.49097D+00	2.00	43	55.30	80	53.40	43	54.90	80	53.40	0.002
742	-0.22831D+02	-0.23309D+02	31.00	44	25.50	79	7.60	44	29.20	79	9.00	0.026
743	0.19191D+01	0.87132D+00	54.00	44	14.90	78	44.70	44	21.10	78	43.50	0.079
744	0.19643D+02	0.20128D+02	9.00	46	28.70	80	53.40	46	29.30	80	59.60	0.003
745	0.11904D+02	0.11891D+02	37.00	47	23.80	79	41.40	47	23.80	79	41.30	3.355
746	-0.18757D+01	-0.22945D+01	13.00	45	32.30	75	48.50	45	34.70	75	52.10	0.008
747	0.14478D+02	0.14119D+02	4.00	45	15.90	75	18.50	45	16.40	75	16.70	0.002
748	-0.70031D+01	-0.69841D+01	42.00	44	13.50	76	29.00	44	13.50	76	29.30	1.441

749	0.46892D+01	0.47430D+01	26.00	48	22.90	89	14.70	48	22.70	89	14.80	0.539
750	-0.35098D+01	-0.34660D+01	49.50	48	28.50	80	21.50	48	28.50	80	21.80	2.001
751	0.36342D+01	0.45403D+01	13.00	46	17.10	78	55.00	46	16.10	79	0.0	0.008
752	-0.14732D+02	-0.14603D+02	3.00	42	51.30	80	29.50	42	51.30	80	31.50	0.001
753	-0.45720D+01	-0.43020D+01	8.00	46	27.40	80	23.70	46	27.60	80	26.70	0.005
754	0.10758D+01	0.66138D+00	17.00	46	5.10	80	39.00	46	7.10	80	40.40	0.022
755	0.44824D+01	0.44525D+01	34.00	46	33.90	81	8.40	46	35.20	81	11.90	0.071
756	-0.80682D+01	-0.77421D+01	34.00	46	34.50	81	16.80	46	36.10	81	24.50	0.035
757	0.10160D+01	0.87453D+00	24.00	46	36.10	81	24.50	46	37.20	81	26.40	0.057
758	0.76200D+01	0.66692D+01	24.00	46	37.20	81	26.40	46	42.50	81	33.20	0.014
759	-0.15818D+01	-0.24890D+01	58.00	48	1.00	84	31.30	48	4.00	84	33.00	0.176
760	-0.48C06D+01	-0.46683D+01	12.00	42	6.30	83	6.60	42	8.10	83	6.90	0.013
761	-0.92015D+00	-0.10317D+01	53.00	48	57.30	87	57.50	48	59.60	88	1.50	0.132
762	-0.39858D+01	-0.40732D+01	13.00	43	39.00	81	42.40	43	40.50	81	42.40	0.019
763	0.70338D-01	-0.73452D-01	13.00	43	36.40	81	42.40	43	39.00	81	42.40	0.011
764	-0.49161D-02	0.38634D-01	62.00	44	25.80	80	50.60	44	23.40	80	47.40	0.199
765	-0.93726D+01	-0.94362D+01	4.00	45	20.40	80	0.0	45	20.90	80	0.50	0.004
766	0.18593D+01	0.20025D+01	50.00	48	28.80	81	19.50	48	28.50	81	19.50	1.405
767	-0.13252D+01	-0.13157D+01	11.50	46	30.50	84	19.70	46	30.40	84	19.50	0.131
768	-0.38100D+01	-0.41405D+01	54.00	46	31.30	84	20.60	46	32.90	84	21.80	0.273
769	0.12954D+02	0.12937D+02	8.00	47	27.10	79	37.90	47	27.30	79	38.40	0.027
770	-0.36407D+01	-0.51796D+01	36.00	47	15.50	79	45.00	47	20.30	79	48.00	0.042
771	0.80433D+00	-0.14846D+01	36.00	47	20.30	79	48.00	47	23.80	79	41.40	0.038
772	0.12192D+02	0.12023D+02	2.00	43	36.30	79	44.80	43	37.00	79	43.00	0.000
773	0.14369D+01	0.14515D+01	42.00	43	54.60	80	52.50	43	54.80	80	52.90	0.874
774	-0.40234D+01	-0.38561D+01	5.00	42	59.10	82	20.70	42	59.20	82	22.50	0.003
775	-0.22738D+02	-0.22618D+02	5.00	42	59.00	82	19.40	42	59.10	82	20.70	0.005
776	0.21336D+01	0.22536D+01	5.00	42	59.00	82	17.40	42	59.00	82	18.70	0.005
777	-0.60960D+00	-0.31636D+00	3.00	49	7.90	90	45.40	49	8.60	90	48.20	0.001
778	0.22801D+01	0.21686D+01	52.00	44	45.00	79	53.20	44	44.80	79	51.50	0.384
779	0.39757D+01	0.40889D+01	11.50	46	30.50	84	19.70	46	30.70	84	21.50	0.017
780	-0.43088D+01	-0.44486D+01	44.00	43	55.80	81	42.10	43	57.60	81	42.20	0.113
781	0.32539D+01	0.23940D+01	37.00	46	18.50	79	27.30	46	20.90	79	26.50	0.094
782	-0.86497D+00	-0.73970D+00	37.00	46	19.50	79	28.30	46	19.00	79	28.00	0.427
783	-0.28194D+02	-0.28210D+02	4.00	43	17.80	79	48.00	43	17.90	79	47.80	0.016
784	0.25537D+01	0.18490D+01	37.00	46	56.00	79	43.80	46	58.10	79	44.40	0.108
785	-0.21336D+01	-0.20539D+01	12.00	42	3.70	83	6.80	42	5.10	83	6.80	0.017
786	-0.16525D+01	-0.12395D+01	41.50	46	11.50	77	41.00	46	10.40	77	41.30	0.162
787	0.25116D+02	0.25216D+02	5.00	42	58.90	82	16.30	42	59.00	82	17.40	0.006
788	0.68275D+01	0.68923D+01	5.00	42	59.00	82	18.70	42	59.00	82	19.40	0.009
789	-0.26883D+02	-0.26809D+02	5.00	42	59.20	82	22.50	42	59.30	82	23.30	0.008
790	0.12192D+02	0.12235D+02	8.50	44	5.50	81	18.80	44	4.80	81	18.50	0.017
791	0.91440D+01	0.89537D+01	2.00	43	37.00	79	43.00	43	37.80	79	41.00	0.000
792	-0.30480D+01	-0.30276D+01	3.00	43	25.80	80	31.20	43	25.50	80	31.30	0.005
793	-0.17542D+01	-0.21931D+01	49.00	49	43.70	83	52.90	49	43.00	83	48.30	0.125
794	0.62900D+01	0.56266D+01	11.00	46	28.50	84	4.10	46	32.50	84	8.90	0.004
795	0.83127D+00	0.83832D+00	11.00	46	32.50	84	8.90	46	32.80	84	9.90	0.027
796	-0.77585D+00	0.20521D+00	11.00	46	32.80	84	9.90	46	31.40	84	16.60	0.004
797	0.59297D+01	0.63064D+01	11.00	46	31.20	84	17.50	46	30.40	84	19.30	0.014
798	0.44621D+01	0.64091D+01	61.00	42	18.30	82	32.70	42	18.50	82	50.70	0.051
799	0.14344D+01	0.15629D+01	17.00	48	43.30	94	33.70	48	43.20	94	35.20	0.047
800	-0.16316D+02	-0.16178D+02	17.00	48	43.50	94	32.00	48	43.30	94	33.70	0.041
801	0.14161D+02	0.28499D+01	37.00	49	22.40	88	8.20	49	41.10	87	32.20	0.007
802	0.16348D+01	0.17691D+01	11.00	46	31.40	84	16.60	46	31.20	84	17.50	0.031
803	-0.20761D+01	-0.82265D+00	53.00	48	59.30	88	15.70	48	56.00	88	18.70	0.122
804	0.81280D+00	0.11252D+01	3.00	49	52.80	93	21.10	49	54.10	93	21.60	0.001
805	0.41656D+01	0.43984D+01	3.00	49	47.80	92	51.00	49	48.60	92	51.80	0.002
806	-0.43688D+01	-0.42238D+01	3.00	49	24.90	91	39.80	49	25.10	91	40.80	0.002
807	-0.20320D+00	0.27428D+00	3.00	49	17.30	91	18.30	49	18.30	91	22.10	0.001
808	0.81280D+00	0.14007D+01	3.00	49	14.50	91	2.40	49	14.80	91	6.80	0.000
809	0.10160D+00	0.10160D+00	3.00	47	46.30	83	22.50	47	46.30	83	22.50	0.024

810	-0.29261D+02	-0.29250D+02	1.00	43	28.30	80	30.80	43	29.10	80	31.50	0.000
811	0.0	0.59046D-01	4.00	43	28.00	80	27.30	43	27.80	80	28.00	0.005
812	-0.15951D+02	-0.15899D+02	3.00	43	49.80	80	31.30	43	49.80	80	32.00	0.003
813	-0.20726D+02	-0.20817D+02	1.00	44	0.80	79	40.80	44	1.30	79	40.30	0.000
814	-0.95903D+01	-0.11402D+02	28.00	44	25.30	78	16.40	44	33.50	78	12.50	0.010
815	-0.29947D+02	-0.29983D+02	8.00	44	22.80	77	53.80	44	23.00	77	53.80	0.054
816	-0.51054D+01	-0.50145D+01	12.00	42	2.20	82	44.50	42	2.20	82	45.30	0.044
817	-0.18288D+02	-0.18283D+02	8.00	42	52.40	79	15.10	42	52.40	79	15.20	0.157
818	-0.60960D+01	-0.65924D+01	10.00	48	32.30	89	41.20	48	32.40	89	36.60	0.005
819	0.29905D+01	0.30567D+01	53.00	49	0.20	88	12.50	49	1.20	88	15.00	0.238
820	-0.92015D+00	-0.10317D+01	53.00	48	57.30	87	57.50	48	59.60	88	1.50	0.132
821	0.18921D+01	0.20301D+01	53.00	48	54.30	87	43.10	48	55.30	87	46.40	0.191
822	0.36678D+01	0.11446D+01	60.00	48	44.30	91	58.50	48	45.00	91	35.00	0.038
823	-0.19568D+02	-0.19538D+02	5.00	49	24.90	91	39.80	49	24.90	91	40.00	0.031
824	0.28651D+02	0.28911D+02	1.00	46	31.40	84	15.80	46	31.00	84	17.50	0.000
825	-0.74645D-01	-0.31670D+00	49.00	46	26.20	80	16.50	46	25.80	80	13.20	0.176
826	-0.52730D+02	-0.52193D+02	3.00	48	56.40	90	9.80	48	57.20	90	15.20	0.000
827	-0.25908D+02	-0.25819D+02	3.00	49	50.90	93	21.80	49	51.80	93	21.50	0.002
828	0.25400D+01	0.21314D+01	3.00	47	45.30	83	22.80	47	46.30	83	22.50	0.001
829	-0.27635D+02	-0.27356D+02	3.00	49	15.40	91	13.30	49	15.80	91	15.50	0.001
830	0.23774D+01	0.48792D+00	60.00	48	38.30	93	21.50	48	42.50	93	1.50	0.042
831	0.62007D+01	0.40076D+01	49.50	48	32.00	80	27.90	48	42.00	80	47.20	0.025
832	0.10160D+00	-0.14194D+00	3.00	47	44.80	83	23.30	47	45.30	83	22.80	0.003
833	-0.15240D+01	-0.14916D+01	13.00	42	34.00	82	22.80	42	35.10	82	22.80	0.026
834	0.17374D+02	0.17888D+01	100.00	43	38.40	79	22.80	44	13.10	76	31.10	0.137
835	0.11582D+02	-0.22028D+01	100.00	43	38.40	79	22.80	44	0.0	76	13.00	0.139
836	-0.57912D+01	-0.39916D+01	100.00	44	13.10	76	31.10	44	0.0	76	13.00	0.289
837	-0.94488D+01	-0.30558D+01	100.00	43	25.00	76	35.00	43	38.40	79	22.80	0.138
838	0.79248D+01	-0.12669D+01	100.00	43	25.00	76	35.00	44	13.10	76	31.10	0.277
839	0.21336D+01	-0.52586D+01	100.00	43	25.00	76	35.00	44	0.0	76	13.00	0.311
840	-0.60960D+01	-0.12977D+02	100.00	42	39.50	81	12.80	42	52.40	79	15.20	0.052
841	0.30480D+00	-0.76217D+01	100.00	42	39.50	81	12.80	42	55.00	78	52.00	0.052
842	-0.54864D+01	-0.35596D+01	100.00	42	39.50	81	12.80	41	30.00	81	38.00	0.047
843	-0.64008D+01	-0.53554D+01	100.00	42	55.00	78	52.00	42	52.40	79	15.20	0.131
844	-0.57912D+01	-0.12380D+01	100.00	42	55.00	78	52.00	41	30.00	81	38.00	0.079
845	-0.60960D+00	-0.41174D+01	100.00	41	30.00	81	38.00	42	52.40	79	15.20	0.080
846	-0.20726D+02	-0.52852D+01	100.00	46	15.20	83	33.10	43	44.80	81	43.70	0.075
847	0.0	0.33694D+01	100.00	46	15.20	83	33.10	44	30.30	80	13.00	0.133
848	-0.19202D+02	0.83235D+00	100.00	46	15.20	83	33.10	43	55.00	82	45.00	0.073
849	-0.11582D+02	0.15617D+01	100.00	46	15.20	83	33.10	45	47.00	84	47.00	0.076
850	0.20422D+02	0.83498D+01	100.00	43	44.80	81	43.70	44	30.30	80	13.00	0.049
851	0.15240D+01	0.61175D+01	100.00	43	44.80	81	43.70	43	55.00	82	45.00	0.077
852	0.94488D+01	0.71516D+01	100.00	43	44.80	81	43.70	45	47.00	84	47.00	0.047
853	-0.19202D+02	-0.25371D+01	100.00	44	30.30	80	13.00	43	55.00	82	45.00	0.301
854	-0.11278D+02	-0.15029D+01	100.00	44	30.30	80	13.00	45	47.00	84	47.00	0.075
855	-0.76200D+01	-0.72932D+00	100.00	45	47.00	84	47.00	43	55.00	82	45.00	0.074
856	0.57912D+01	-0.15202D+01	100.00	46	29.00	84	40.00	48	24.60	89	13.00	0.073
857	0.28956D+02	0.27706D+01	100.00	46	29.00	84	40.00	47	57.70	84	54.00	0.131
858	-0.12192D+02	0.25959D-01	100.00	46	29.00	84	40.00	46	32.00	87	27.00	0.289
859	-0.23470D+02	0.10716D+01	100.00	46	29.00	84	40.00	46	45.00	92	6.00	0.074
860	-0.23165D+02	-0.42909D+01	100.00	47	57.70	84	54.00	48	24.60	89	13.00	0.046
861	-0.40843D+02	-0.24399D+01	100.00	47	57.70	84	54.00	46	32.00	87	27.00	0.128
862	-0.52121D+02	-0.13942D+01	100.00	47	57.70	84	54.00	46	45.00	92	6.00	0.046
863	-0.17678D+02	0.18510D+01	100.00	48	24.60	89	13.00	46	22.00	87	27.00	0.074
864	-0.28956D+02	0.28966D+01	100.00	48	24.60	89	13.00	46	45.00	92	6.00	0.072
865	0.11278D+02	-0.10457D+01	100.00	46	45.00	92	6.00	46	32.00	87	27.00	0.133
866	0.23652D+02	0.10265D+02	100.00	42	1.60	82	44.10	42	52.40	79	15.20	0.001
867	0.79248D+00	-0.22495D+00	100.00	43	14.20	79	13.20	43	38.40	79	22.80	0.017
868	0.21549D+02	0.49471D+01	100.00	43	14.20	79	13.20	44	13.10	76	31.10	0.009
869	0.30480D+00	-0.64292D+01	100.00	46	15.20	83	33.10	45	20.30	80	2.20	0.005
870	-0.20726D+01	0.30308D+01	100.00	45	20.30	80	2.20	44	30.30	80	13.00	0.005

871	-0.79553D+01	0.14220D+02	100.00	45	20.30	80	2.20	43	44.80	81	43.70	0.001
872	0.13106D+02	0.66002D+01	100.00	42	1.60	82	44.10	42	39.50	81	12.80	0.001

(ii) 3-rd Order Surface

OBSER. NUMBER	OBSER. VECTOR	RESIDUAL	TIME SPAN	PHI A	LAMDA A	PHI B	LAMDA B	WEIGHT
1	0.63835D+00	0.10004D+01	53.00	48 47.30	87 11.00	48 47.40	87 14.20	0.215
2	-0.11502D+01	-0.98606D+00	53.00	48 39.60	86 16.10	48 39.30	86 17.10	0.631
3	0.10208D+02	0.12220D+02	53.00	48 52.90	88 23.60	48 46.80	88 33.10	0.053
4	-0.86839D+01	-0.83670D+01	53.00	49 1.20	88 15.00	48 59.30	88 15.70	0.242
5	0.29905D+01	0.31342D+01	53.00	49 0.20	88 12.50	49 1.20	88 15.00	0.238
6	0.30480D+01	0.73243D+00	3.00	49 51.80	93 21.50	49 52.80	93 21.10	0.001
7	0.11786D+02	0.97266D+01	3.00	49 54.10	93 21.60	49 54.90	93 21.50	0.002
8	0.51816D+01	0.41398D+01	3.00	49 54.90	93 21.50	49 55.40	93 21.10	0.003
9	0.52832D+01	0.20797D+01	3.00	49 55.40	93 21.10	49 56.50	93 21.40	0.001
10	0.50800D+00	-0.25862D+01	3.00	49 56.50	93 21.40	49 57.60	93 21.50	0.001
11	-0.31499D+01	-0.41391D+01	3.00	49 57.60	93 21.50	49 57.90	93 21.70	0.005
12	0.13919D+02	0.12227D+02	3.00	49 50.50	93 20.80	49 50.90	93 21.50	0.001
13	0.13716D+02	0.11847D+02	3.00	49 50.10	93 19.50	49 50.50	93 20.80	0.002
14	0.89408D+01	0.68522D+01	3.00	49 49.60	93 18.20	49 50.10	93 19.50	0.001
15	0.11176D+02	0.83831D+01	3.00	49 48.50	93 16.50	49 48.50	93 16.50	0.001
16	-0.29464D+01	-0.47187D+01	3.00	49 48.50	93 15.20	49 48.90	93 16.50	0.002
17	0.81280D+00	0.28411D-01	3.00	49 48.30	93 14.70	49 48.50	93 15.20	0.004
18	0.54864D+01	0.50398D+01	3.00	49 48.50	93 13.20	49 48.50	93 14.70	0.001
19	0.13411D+02	0.12132D+02	3.00	49 48.50	93 11.10	49 48.50	93 13.20	0.001
20	0.19202D+02	0.18719D+02	3.00	49 48.50	93 10.30	49 48.50	93 11.10	0.003
21	-0.92456D+01	-0.10087D+02	3.00	49 48.50	93 8.90	49 48.50	93 10.30	0.002
22	0.67056D+01	0.62275D+01	3.00	49 48.50	93 8.10	49 48.50	93 8.90	0.003
23	0.79248D+01	0.70227D+01	3.00	49 48.60	93 6.20	49 48.50	93 8.10	0.001
24	0.11379D+02	0.10612D+02	3.00	49 48.60	93 4.90	49 48.60	93 6.20	0.002
25	0.25400D+01	0.11962D+01	3.00	49 48.60	93 2.60	49 48.60	93 4.90	0.001
26	-0.17272D+01	-0.25372D+01	3.00	49 48.60	93 1.20	49 48.60	93 2.60	0.002
27	-0.80264D+01	-0.97766D+01	3.00	49 48.60	92 55.80	49 48.70	92 58.90	0.001
28	-0.17272D+01	-0.24126D+01	3.00	49 48.60	92 58.90	49 48.50	93 0.10	0.002
29	-0.14224D+02	-0.14224D+02	3.00	49 48.60	92 58.90	49 48.60	92 58.90	0.002
30	-0.10465D+02	-0.11301D+02	3.00	49 48.60	92 54.30	49 48.60	92 55.80	0.001
31	0.13208D+01	0.32624D+00	3.00	49 48.60	92 52.50	49 48.60	92 54.30	0.001
32	0.81280D+00	0.42868D+00	3.00	49 48.60	92 51.80	49 48.60	92 52.50	0.003
33	-0.27432D+01	-0.49561D+01	3.00	49 46.80	92 50.50	49 47.50	92 51.00	0.001
34	-0.13513D+02	-0.14279D+02	3.00	49 46.70	92 49.50	49 46.80	92 50.60	0.002
35	0.37592D+01	0.37923D+01	3.00	49 46.90	92 48.90	49 46.70	92 49.50	0.003
36	-0.72136D+01	-0.80759D+01	3.00	49 46.80	92 47.50	49 46.80	92 43.80	0.002
37	-0.12192D+02	-0.12914D+02	3.00	49 46.90	92 45.70	49 46.80	92 47.50	0.001
38	-0.18593D+02	-0.19399D+02	3.00	49 46.90	92 44.10	49 46.90	92 45.70	0.001
39	0.97536D+01	0.91535D+01	3.00	49 46.90	92 42.90	49 46.90	92 44.10	0.002
40	0.31496D+01	0.21407D+01	3.00	49 46.60	92 42.00	49 46.90	92 42.90	0.002
41	-0.59944D+01	-0.81457D+01	3.00	49 45.70	92 41.00	49 46.60	92 42.00	0.001
42	0.15240D+01	0.22685D+00	3.00	49 45.70	92 39.80	49 45.70	92 41.00	0.002
43	0.12192D+01	0.33865D-01	3.00	49 44.50	92 38.80	49 45.30	92 39.80	0.002

44	-0.45720D+01	-0.58727D+01	3.00	49	44.40	92	37.90	49	44.90	92	38.90	0.002
45	-0.30480D+00	-0.17614D+01	3.00	49	43.80	92	37.00	49	44.40	92	37.90	0.002
46	-0.33528D+01	-0.46131D+01	3.00	49	43.20	92	36.50	49	43.80	92	37.00	0.002
47	-0.75184D+01	-0.82500D+01	3.00	49	42.90	92	36.00	49	43.20	92	36.50	0.003
48	0.54864D+01	0.34942D+01	3.00	49	42.00	92	34.90	49	42.90	92	36.00	0.001
49	0.28448D+01	0.18054D+01	3.00	49	41.60	92	34.00	49	42.00	92	34.90	0.002
50	-0.97536D+01	-0.10410D+02	3.00	49	41.40	92	33.20	49	41.60	92	34.00	0.003
51	-0.56896D+01	-0.63356D+01	3.00	49	41.30	92	32.00	49	41.40	92	33.20	0.002
52	-0.39624D+01	-0.44831D+01	3.00	49	41.20	92	31.10	49	41.30	92	32.00	0.002
53	-0.35560D+01	-0.36680D+01	3.00	49	41.40	92	30.00	49	41.20	92	31.10	0.002
54	0.14224D+02	0.12665D+02	3.00	49	40.50	92	29.70	49	41.40	92	30.00	0.002
55	0.11278D+02	0.10446D+02	3.00	49	40.00	92	29.60	49	40.50	92	29.70	0.003
56	0.32512D+01	0.16981D+01	3.00	49	39.20	92	28.80	49	40.00	92	29.60	0.002
57	-0.80264D+01	-0.87830D+01	3.00	49	38.90	92	28.00	49	39.20	92	28.80	0.002
58	0.17272D+01	0.71990D+00	3.00	49	38.50	92	26.90	49	38.90	92	28.00	0.002
59	-0.21946D+02	-0.24655D+02	3.00	49	36.70	92	26.90	49	38.50	92	26.90	0.001
60	0.27432D+01	0.16393D+01	3.00	49	36.20	92	25.80	49	36.70	92	26.90	0.002
61	-0.74168D+01	-0.88225D+01	3.00	49	35.50	92	24.60	49	36.20	92	25.80	0.001
62	0.30480D+00	-0.95529D+00	3.00	49	35.10	92	22.40	49	35.50	92	24.60	0.001
63	0.22657D+02	0.21705D+02	3.00	49	34.90	92	20.20	49	35.10	92	22.40	0.001
64	0.16967D+02	0.16666D+02	3.00	49	34.90	92	19.20	49	34.90	92	20.20	0.002
65	0.45720D+01	0.42731D+01	3.00	49	34.90	92	18.20	49	34.90	92	19.20	0.002
66	-0.53848D+01	-0.58710D+01	3.00	49	35.00	92	16.10	49	34.90	92	18.20	0.001
67	-0.50800D+01	-0.58667D+01	3.00	49	34.50	92	15.70	49	35.00	92	16.10	0.003
68	0.26111D+02	0.24976D+02	3.00	49	33.90	92	14.50	49	34.50	92	15.70	0.001
69	0.19609D+02	0.18982D+02	3.00	49	33.10	92	12.00	49	33.40	92	12.90	0.002
70	0.35560D+01	0.25807D+01	3.00	49	32.60	92	10.70	49	33.10	92	12.00	0.001
71	-0.35344D+01	-0.33152D+01	3.00	49	32.20	92	9.60	49	32.60	92	10.70	0.002
72	0.11481D+02	0.11005D+02	3.00	49	32.10	92	8.20	49	32.20	92	9.60	0.002
73	0.28448D+01	0.30823D+01	3.00	49	32.50	92	7.20	49	32.10	92	8.20	0.002
74	0.50800D+01	0.37932D+01	3.00	49	31.60	92	6.40	49	32.50	92	7.20	0.001
75	-0.28446D+01	-0.36558D+01	3.00	49	31.20	92	5.00	49	31.60	92	6.40	0.001
76	-0.58928D+01	-0.68741D+01	3.00	49	30.60	92	3.80	49	31.20	92	5.00	0.001
77	-0.61976D+01	-0.71361D+01	3.00	49	30.00	92	2.70	49	30.60	92	3.80	0.002
78	-0.14732D+02	-0.15157D+02	3.00	49	29.80	92	1.80	49	30.00	92	2.70	0.002
79	-0.23368D+01	-0.32823D+01	3.00	49	29.30	92	0.0	49	29.80	92	1.80	0.001
80	-0.15240D+01	-0.19118D+01	3.00	49	29.10	91	59.20	49	29.30	92	0.0	0.003
81	-0.14732D+02	-0.15149D+02	3.00	49	29.00	91	57.70	49	29.10	91	59.20	0.001
82	-0.83312D+01	-0.93434D+01	3.00	49	28.30	91	56.40	49	29.00	91	57.70	0.001
83	-0.34544D+01	-0.45517D+01	3.00	49	27.80	91	53.40	49	28.30	91	56.40	0.001
84	0.75184D+01	0.70258D+01	3.00	49	27.50	91	52.40	49	27.80	91	53.40	0.002
85	0.34328D+01	0.80311D+01	3.00	49	27.30	91	51.30	49	27.50	91	52.40	0.002
86	-0.11786D+02	-0.12099D+02	3.00	49	27.20	91	50.10	49	27.30	91	51.30	0.002
87	-0.50800D+00	-0.63619D+00	3.00	49	27.30	91	48.80	49	27.20	91	50.10	0.002
88	0.11176D+01	0.34529D+00	3.00	49	27.00	91	46.00	49	27.30	91	48.80	0.001
89	0.81280D+00	-0.21463D-01	3.00	49	26.30	91	45.00	49	27.00	91	46.00	0.002
90	-0.17272D+01	-0.22472D+01	3.00	49	25.90	91	44.10	49	26.30	91	45.00	0.002
91	0.81280D+01	0.81434D+01	3.00	49	26.10	91	43.00	49	25.90	91	44.10	0.002
92	-0.21336D+01	-0.26867D+01	3.00	49	25.80	91	41.20	49	26.10	91	43.00	0.001
93	0.26416D+01	0.19457D+01	3.00	49	25.10	91	40.80	49	25.80	91	41.20	0.002
94	-0.14122D+02	-0.14557D+02	3.00	49	24.60	91	38.60	49	24.90	91	39.80	0.002
95	-0.40640D+00	-0.11010D+01	3.00	49	23.90	91	38.00	49	24.60	91	38.60	0.002
96	-0.45720D+01	-0.50133D+01	3.00	49	23.60	91	36.60	49	23.90	91	38.00	0.002
97	-0.14224D+02	-0.14847D+02	3.00	49	23.00	91	35.70	49	23.60	91	36.60	0.002
98	-0.13208D+01	-0.30198D+01	3.00	49	21.40	91	32.40	49	23.00	91	35.70	0.001
99	-0.13513D+02	-0.14028D+02	3.00	49	20.90	91	31.30	49	21.40	91	32.40	0.002
100	0.14224D+01	0.10652D+01	3.00	49	20.60	91	30.10	49	20.90	91	31.30	0.002
101	-0.50800D+01	-0.54488D+01	3.00	49	20.30	91	28.70	49	20.60	91	30.10	0.002
102	-0.25806D+02	-0.26549D+02	3.00	49	19.60	91	26.40	49	20.30	91	28.70	0.001
103	-0.32512D+01	-0.36030D+01	3.00	49	19.30	91	24.90	49	19.60	91	26.40	0.001
104	0.10160D+02	0.97849D+01	3.00	49	18.90	91	23.90	49	19.30	91	24.90	0.002

105	-0.18286D+01	-0.23997D+01	3.00	49	18.30	91	22.10	49	18.90	91	23.90	0.001
106	-0.50800D+01	-0.54739D+01	3.00	49	16.80	91	17.40	49	17.30	91	18.30	0.002
107	-0.69088D+01	-0.73719D+01	3.00	49	16.20	91	16.30	49	16.60	91	17.40	0.002
108	-0.11074D+02	-0.11380D+02	3.00	49	15.80	91	15.50	49	16.20	91	16.30	0.002
109	-0.66040D+01	-0.67911D+01	3.00	49	15.20	91	12.00	49	15.40	91	13.30	0.002
110	-0.13208D+02	-0.13230D+02	3.00	49	15.30	91	10.10	49	15.20	91	12.00	0.001
111	-0.67056D+01	-0.65686D+01	3.00	49	15.60	91	9.00	49	15.30	91	10.10	0.002
112	-0.89408D+01	-0.95165D+01	3.00	49	14.80	91	6.80	49	15.60	91	9.00	0.001
113	0.14224D+02	0.14000D+02	3.00	49	14.20	91	6.60	49	14.50	91	2.40	0.001
114	-0.69088D+01	-0.73249D+01	3.00	49	11.60	90	52.40	49	12.40	90	53.00	0.002
115	0.26416D+01	0.23329D+01	3.00	49	11.00	90	51.50	49	11.60	90	52.40	0.002
116	-0.12192D+02	-0.12493D+02	3.00	49	10.40	90	50.50	49	11.00	90	51.50	0.002
117	-0.68072D+01	-0.71511D+01	3.00	49	9.70	90	50.40	49	10.40	90	50.50	0.002
118	-0.12192D+02	-0.12483D+02	3.00	49	9.10	90	50.00	49	9.70	90	50.40	0.002
119	-0.37592D+01	-0.38983D+01	3.00	49	8.80	90	49.10	49	9.10	90	50.00	0.002
120	-0.14732D+02	-0.14820D+02	3.00	49	8.60	90	48.20	49	8.80	90	49.10	0.002
121	-0.12192D+01	-0.12976D+01	3.00	49	7.70	90	44.50	49	7.90	90	45.40	0.002
122	0.91440D+00	0.66613D+00	3.00	49	7.10	90	43.20	49	7.70	90	44.50	0.001
123	-0.73152D+01	-0.75660D+01	3.00	49	5.20	90	42.10	49	5.80	90	42.50	0.002
124	0.20422D+02	0.19983D+02	3.00	49	4.10	90	41.00	49	5.20	90	42.10	0.001
125	0.80264D+01	0.77482D+01	3.00	49	3.40	90	40.50	49	4.10	90	41.00	0.002
126	0.11379D+02	0.11210D+02	3.00	49	2.90	90	39.40	49	3.40	90	40.50	0.002
127	0.17272D+01	0.16455D+01	3.00	49	2.60	90	38.30	49	2.90	90	39.40	0.002
128	-0.15342D+02	-0.15283D+02	3.00	49	2.60	90	36.80	49	2.60	90	38.30	0.001
129	-0.99568D+01	-0.98217D+01	3.00	49	2.80	90	35.40	49	2.60	90	36.80	0.002
130	-0.20726D+02	-0.20683D+02	3.00	49	2.80	90	34.30	49	2.80	90	35.40	0.002
131	0.89408D+01	0.90226D+01	3.00	49	2.80	90	32.30	49	2.80	90	34.30	0.001
132	0.43656D+01	0.44276D+01	3.00	49	2.80	90	30.30	49	2.80	90	32.30	0.002
133	0.54864D+01	0.55378D+01	3.00	49	2.80	90	29.70	49	2.80	90	30.90	0.002
134	-0.52832D+01	-0.52265D+01	3.00	49	2.80	90	28.40	49	2.80	90	29.70	0.002
135	-0.22352D+01	-0.23759D+01	3.00	49	2.40	90	28.20	49	2.80	90	28.40	0.004
136	0.11989D+02	0.11886D+02	3.00	49	2.10	90	28.00	49	2.40	90	28.20	0.005
137	0.16866D+02	0.16665D+02	3.00	49	1.40	90	26.80	49	2.10	90	28.00	0.001
138	-0.83312D+01	-0.83940D+01	3.00	48	58.50	90	20.40	48	58.90	90	21.60	0.002
139	-0.16459D+02	-0.16518D+02	3.00	48	58.10	90	19.20	48	58.50	90	20.40	0.002
140	-0.61976D+01	-0.62261D+01	3.00	48	57.50	90	16.60	48	58.10	90	19.20	0.001
141	0.76200D+01	0.76172D+01	3.00	48	57.20	90	15.20	48	57.50	90	16.60	0.002
142	0.45720D+01	0.46216D+01	3.00	48	56.30	90	8.70	48	56.40	90	9.80	0.002
143	-0.11878D+02	-0.11874D+02	3.00	48	56.00	90	7.30	48	56.30	90	8.70	0.002
144	-0.84328D+01	-0.84738D+01	3.00	48	54.10	90	1.50	48	54.70	90	3.10	0.001
145	0.11684D+02	0.11452D+02	3.00	48	52.50	89	59.00	48	54.10	90	1.50	0.001
146	0.10871D+02	0.10796D+02	3.00	48	52.00	89	58.30	48	52.50	89	59.00	0.002
147	-0.12192D+02	-0.12235D+02	44.00	44	26.50	81	24.20	44	26.70	81	24.10	0.965
148	-0.17387D+01	-0.16856D+01	44.00	44	29.60	81	22.40	44	29.40	81	22.60	0.840
149	0.59319D+01	0.58695D+01	13.00	42	30.10	82	18.40	42	31.40	82	20.00	0.017
150	0.36107D+01	0.35312D+01	13.00	42	31.40	82	20.00	42	33.30	82	22.40	0.011
151	-0.29073D+01	-0.28983D+01	13.00	42	33.30	82	22.40	42	34.00	82	22.80	0.038
152	0.24853D+01	0.24974D+01	13.00	42	35.10	82	22.80	42	35.60	82	23.00	0.055
153	-0.44313D+01	-0.44263D+01	13.00	42	35.60	82	23.00	42	35.70	82	23.00	0.285
154	-0.84172D+01	-0.84172D+01	13.00	42	35.70	82	23.00	42	35.70	82	23.00	0.528
155	-0.86751D+00	-0.86583D+00	13.00	43	1.20	82	19.50	43	1.20	82	19.00	0.083
156	0.67056D+01	0.67073D+01	13.00	43	1.20	82	19.00	43	1.50	82	17.40	0.025
157	0.11020D+01	0.11054D+01	13.00	43	1.50	82	17.40	43	1.70	82	15.20	0.019
158	0.20398D+01	0.20339D+01	13.00	43	1.70	82	15.20	43	2.20	82	13.50	0.022
159	-0.37045D+01	-0.37101D+01	13.00	43	2.20	82	13.50	43	2.60	82	11.20	0.017
160	0.32356D+01	0.32502D+01	13.00	43	2.60	82	11.20	43	2.20	82	9.90	0.029
161	0.16178D+01	0.16119D+01	13.00	43	2.20	82	9.90	43	2.40	82	9.80	0.135
162	0.12895D+01	0.12684D+01	13.00	43	2.40	82	9.80	43	3.20	82	5.70	0.010
163	0.24384D+01	0.23646D+01	13.00	43	3.10	82	0.20	43	4.50	82	0.10	0.020
164	-0.50878D+01	-0.51589D+01	13.00	43	4.50	82	0.10	43	5.80	82	0.10	0.022
165	0.27901D+01	0.27845D+01	13.00	43	5.80	82	0.10	43	5.90	82	0.10	0.285

166	0.11723D+00	0.11723D+00	13.00	43	5.90	82	0.10	43	5.90	82	0.10	0.528
167	-0.14068D+00	-0.13449D+00	13.00	43	5.80	82	0.10	43	5.70	82	0.30	0.168
168	-0.67759D+01	-0.67621D+01	13.00	43	3.20	82	5.70	43	3.10	82	0.20	0.008
169	-0.70338D+00	-0.75475D+00	13.00	43	9.30	81	59.10	43	10.10	81	59.00	0.035
170	-0.21102D+01	-0.21757D+01	13.00	43	10.10	81	59.00	43	10.90	81	57.90	0.026
171	0.42203D+01	0.42136D+01	13.00	43	10.90	81	57.90	43	11.00	81	57.90	0.285
172	0.17116D+01	0.16169D+01	13.00	43	11.80	81	55.00	43	12.80	81	53.70	0.021
173	0.29542D+01	0.29819D+01	13.00	43	12.80	81	53.70	43	12.30	81	53.00	0.041
174	-0.49237D+01	-0.50144D+01	13.00	43	19.00	81	45.30	43	19.70	81	44.50	0.032
175	0.32825D+00	0.21476D+00	13.00	43	19.70	81	44.50	43	20.50	81	43.70	0.027
176	0.14302D+01	0.13277D+01	13.00	43	10.90	81	57.90	43	11.80	81	55.00	0.013
177	-0.63539D+01	-0.70750D+01	13.00	43	12.80	81	53.70	43	19.00	81	45.30	0.003
178	-0.56505D+01	-0.61452D+01	13.00	43	20.60	81	43.70	43	24.80	81	42.10	0.007
179	0.21805D+01	0.20235D+01	13.00	43	24.80	81	42.10	43	26.20	81	42.00	0.020
180	0.29073D+01	0.27330D+01	13.00	43	26.20	81	42.00	43	27.70	81	41.80	0.019
181	0.20358D+01	0.18740D+01	13.00	43	27.70	81	41.80	43	29.10	81	41.60	0.020
182	-0.23446D+01	-0.24857D+01	13.00	43	29.10	81	41.60	43	30.30	81	41.50	0.024
183	0.36576D+01	0.35149D+01	13.00	43	30.30	81	41.50	43	31.50	81	41.40	0.024
184	-0.12426D+01	-0.13706D+01	13.00	43	31.50	81	41.40	43	32.60	81	41.40	0.026
185	0.32356D+01	0.31306D+01	13.00	43	32.60	81	41.40	43	33.70	81	41.90	0.025
186	0.10316D+01	0.10316D+01	13.00	43	33.70	81	41.90	43	33.70	81	41.90	0.528
187	-0.44782D+01	-0.45154D+01	13.00	43	33.70	81	41.90	43	34.10	81	42.10	0.067
188	0.39155D+01	0.38129D+01	13.00	43	34.10	81	42.10	43	35.10	81	42.40	0.028
189	-0.13364D+01	-0.14901D+01	13.00	43	35.10	81	42.40	43	36.40	81	42.40	0.022
190	0.70338D-01	-0.24158D+00	13.00	43	36.40	81	42.40	43	39.00	81	42.40	0.011
191	-0.39858D+01	-0.41685D+01	13.00	43	39.00	81	42.40	43	40.50	81	42.40	0.019
192	-0.56271D+00	-0.65094D+00	13.00	43	40.50	81	42.40	43	41.30	81	42.40	0.036
193	0.50960D+00	0.32406D+00	13.00	43	41.30	81	42.40	43	43.50	81	42.40	0.012
194	0.63305D+00	0.52625D+00	13.00	43	43.60	81	42.40	43	44.50	81	42.50	0.032
195	0.10082D+01	0.10082D+01	13.00	43	44.50	81	42.50	43	44.50	81	42.50	0.528
196	0.36897D+00	0.15181D+00	38.00	42	2.20	82	43.30	42	2.20	82	44.50	0.293
197	-0.66040D+01	-0.66575D+01	12.00	42	1.70	82	44.00	42	1.60	82	44.20	0.143
198	0.32766D+01	0.29265D+01	12.00	42	0.80	82	49.50	42	0.0	82	50.50	0.023
199	0.91440D+01	0.36941D+01	12.00	42	0.0	82	50.50	41	59.10	82	51.90	0.018
200	-0.60198D+01	-0.65070D+01	12.00	41	59.10	82	51.90	41	59.20	82	54.90	0.012
201	0.64008D+01	0.61561D+01	12.00	41	59.20	82	54.90	41	59.30	82	56.50	0.022
202	0.17018D+01	0.17219D+01	12.00	41	59.30	82	56.50	41	59.90	82	57.30	0.030
203	-0.37338D+01	-0.37881D+01	12.00	41	59.90	82	57.30	42	1.50	83	0.20	0.009
204	-0.64770D+01	-0.62646D+01	12.00	42	1.50	83	0.20	42	3.60	83	2.40	0.009
205	0.24892D+01	0.24234D+01	12.00	42	3.60	83	2.40	42	3.80	83	3.20	0.041
206	-0.61722D+01	-0.63509D+01	12.00	42	3.80	83	3.20	42	3.90	83	4.60	0.025
207	-0.40640D+00	-0.78114D+00	12.00	42	3.90	83	4.60	42	3.70	83	6.80	0.016
208	0.20320D+01	0.23828D+01	12.00	42	5.10	83	6.80	42	6.30	83	6.60	0.020
209	-0.56134D+01	-0.53157D+01	12.00	42	8.10	83	6.90	42	9.10	83	6.60	0.024
210	-0.11963D+02	-0.11311D+02	12.00	42	9.10	83	6.60	42	11.20	83	5.60	0.011
211	0.33020D+00	0.84370D+00	12.00	42	11.20	83	5.60	42	13.60	83	6.20	0.010
212	-0.68580D+00	-0.28294D+00	12.00	42	13.60	83	6.20	42	15.30	83	6.20	0.014
213	-0.14224D+01	-0.14224D+01	12.00	42	15.30	83	6.20	42	15.30	83	6.20	0.450
214	0.32766D+01	0.37941D+01	12.00	42	15.30	83	6.20	42	17.10	83	5.20	0.013
215	-0.12700D+01	-0.87037D+00	12.00	42	17.10	83	5.20	42	18.50	83	4.30	0.016
216	0.27940D+01	0.36017D+01	12.00	42	18.50	83	4.30	42	19.70	82	58.60	0.006
217	-0.17272D+01	-0.14175D+01	12.00	42	19.70	82	58.60	42	20.40	82	56.80	0.017
218	0.51308D+01	0.52191D+01	12.00	42	20.40	82	56.80	42	20.30	82	55.70	0.032
219	-0.27178D+01	-0.29208D+01	12.00	42	20.30	82	55.70	42	20.00	82	57.20	0.023
220	0.29718D+01	0.31331D+01	12.00	42	20.00	82	57.20	42	18.70	82	53.20	0.008
221	-0.16256D+01	-0.15214D+01	12.00	42	18.70	82	53.20	42	18.70	82	52.20	0.035
222	0.16695D+01	0.12498D+01	44.00	44	49.00	81	12.70	44	52.10	81	14.20	0.062
223	-0.13716D+01	-0.21885D+01	44.00	44	52.10	81	14.20	44	58.20	81	17.30	0.032
224	0.10668D+01	0.95495D+00	44.00	44	58.20	81	17.30	45	1.40	81	22.10	0.044
225	0.13508D+01	0.10800D+01	44.00	45	1.40	81	22.10	45	4.20	81	24.60	0.062
226	-0.35745D+01	-0.40857D+01	44.00	45	4.20	81	24.60	45	7.50	81	25.70	0.060

227	-0.25769D+01	-0.25767D+01	44.00	45	7.50	81	25.70	45	10.40	81	31.10	0.043
228	-0.46228D+01	-0.46316D+01	6.00	42	35.40	81	31.80	42	34.80	81	32.70	0.007
229	-0.74168D+01	-0.74347D+01	6.00	42	34.80	81	32.70	42	34.10	81	33.80	0.006
230	-0.18796D+01	-0.18864D+01	6.00	42	34.10	81	33.80	42	33.20	81	34.90	0.005
231	0.20320D+01	0.19961D+01	6.00	42	33.20	81	34.90	42	32.20	81	36.40	0.004
232	0.13208D+01	0.13071D+01	6.00	42	32.20	81	36.40	42	31.20	81	37.50	0.005
233	-0.16180D+02	-0.17751D+02	12.00	42	13.20	92	9.50	42	9.40	82	18.70	0.003
234	-0.14935D+02	-0.16552D+02	12.00	42	9.40	82	18.70	42	5.90	82	26.80	0.004
235	-0.24892D+01	-0.25967D+01	12.00	42	5.90	82	26.80	42	5.80	82	27.40	0.057
236	-0.49784D+01	-0.51837D+01	12.00	42	2.80	82	36.10	42	1.70	82	36.20	0.022
237	0.52324D+01	0.53171D+01	12.00	42	1.70	82	36.20	42	1.50	82	35.50	0.047
238	-0.30480D+00	-0.27028D+00	12.00	42	1.50	82	35.50	42	1.20	82	35.00	0.053
239	-0.23368D+01	-0.23347D+01	12.00	42	1.20	82	35.00	42	0.60	82	34.40	0.033
240	0.10160D+00	0.12612D+00	12.00	42	0.60	82	34.40	41	59.70	82	33.40	0.021
241	0.53340D+00	0.54326D+00	12.00	41	59.70	82	33.40	41	58.90	82	32.60	0.025
242	-0.10922D+01	-0.11177D+01	12.00	41	58.90	82	32.60	41	58.20	82	32.10	0.031
243	0.25400D+00	0.25944D+00	12.00	41	58.20	82	32.10	41	57.90	82	31.80	0.067
244	0.10160D+00	0.11716D+01	12.00	41	57.90	82	31.80	41	56.80	82	31.30	0.021
245	0.18034D+01	0.17147D+01	12.00	41	56.80	82	31.30	41	55.70	82	30.80	0.021
246	-0.33782D+01	-0.35423D+01	12.00	41	55.70	82	30.80	41	54.50	82	30.60	0.020
247	0.60813D+01	0.64137D+01	62.00	44	33.80	80	56.80	44	31.00	80	54.80	0.208
248	0.27825D+01	0.33554D+01	62.00	44	31.00	80	54.80	44	27.20	80	53.40	0.165
249	0.87015D+00	0.88420D+00	62.00	44	27.20	80	53.40	44	25.80	80	50.60	0.272
250	0.83574D+01	0.25457D+00	62.00	44	25.80	80	50.60	44	23.40	80	47.40	0.199
251	0.20089D+00	-0.27692D+00	44.00	44	35.00	80	49.70	44	35.50	80	45.40	0.068
252	0.12434D+02	0.11345D+02	44.00	44	35.50	80	45.40	44	37.20	80	36.70	0.033
253	-0.80772D+01	-0.80142D+01	44.00	44	37.20	80	36.70	44	36.50	80	35.90	0.229
254	-0.62138D+01	-0.61757D+01	44.00	44	36.50	80	35.20	44	36.30	80	35.20	1.020
255	0.67056D+01	0.64723D+01	44.00	44	36.30	80	35.20	44	34.60	80	28.70	0.043
256	-0.21475D+00	0.31970D+00	44.00	44	37.60	80	28.70	44	33.90	80	26.60	0.051
257	0.65809D+00	0.64554D+00	44.00	44	33.60	80	27.10	44	32.20	80	23.70	0.075
258	-0.18788D+01	-0.25044D+01	61.00	42	24.50	82	9.80	42	22.10	82	14.90	0.148
259	-0.39624D+01	-0.53383D+01	61.00	42	22.10	82	14.90	42	19.50	82	25.80	0.079
260	-0.65561D+00	-0.15000D+01	53.00	44	11.70	78	46.60	44	14.90	78	44.70	0.137
261	-0.13208D+01	-0.14281D+01	12.00	44	44.80	79	42.00	44	45.30	79	41.90	0.048
262	-0.26416D+01	-0.28907D+01	12.00	44	45.30	79	41.90	44	46.40	79	41.50	0.021
263	-0.14986D+01	-0.16253D+01	12.00	44	46.40	79	41.50	44	47.30	79	42.20	0.024
264	-0.16764D+01	-0.16930D+01	12.00	44	47.30	79	42.20	44	47.80	79	43.30	0.027
265	0.76454D+01	0.75587D+01	12.00	44	47.80	79	43.30	44	48.20	79	43.20	0.060
266	-0.60251D+00	-0.61759D+00	43.00	44	35.20	79	52.10	44	35.20	79	51.90	1.416
267	0.32323D+01	0.31458D+01	43.00	44	35.20	79	51.90	44	36.00	79	52.90	0.185
268	-0.36363D+01	-0.39993D+01	43.00	44	36.00	79	52.90	44	38.60	79	55.00	0.066
269	-0.63795D+01	-0.39212D+00	43.00	44	38.60	79	55.00	44	41.10	79	57.20	0.067
270	0.22801D+01	0.21879D+01	52.00	44	45.00	79	53.20	44	44.80	79	51.50	0.384
271	-0.27901D+01	-0.30435D+01	52.00	44	44.80	79	51.50	44	44.80	79	48.20	0.201
272	0.64477D+01	0.65325D+01	52.00	44	44.80	79	48.20	44	43.50	79	45.90	0.223
273	-0.61839D+01	-0.64189D+01	52.00	44	43.50	79	45.90	44	43.70	79	43.30	0.253
274	-0.10363D+02	-0.10302D+02	8.00	42	57.00	79	14.90	42	56.80	79	14.90	0.054
275	0.99060D+00	0.10946D+01	8.00	42	53.50	79	14.70	42	53.20	79	15.10	0.027
276	-0.14097D+01	-0.13480D+01	8.00	42	53.20	79	15.10	42	53.00	79	15.10	0.054
277	0.80010D+00	0.86189D+00	8.00	42	53.00	79	15.10	42	52.80	79	15.10	0.054
278	-0.22860D+00	-0.10488D+00	8.00	42	52.80	79	15.10	42	52.40	79	15.10	0.027
279	-0.17907D+01	-0.18052D+01	8.00	42	53.50	79	14.70	42	53.50	79	14.20	0.031
280	-0.10135D+02	-0.10264D+02	8.00	42	53.50	79	14.20	42	53.50	79	10.00	0.004
281	0.30861D+01	0.31351D+01	8.00	42	53.50	79	10.00	42	53.00	79	6.80	0.005
282	0.56388D+01	0.57533D+01	8.00	42	53.00	79	6.80	42	52.50	79	5.60	0.011
283	0.20955D+01	0.20379D+01	8.00	42	53.00	79	3.20	42	53.10	79	2.50	0.022
284	-0.10820D+02	-0.12407D+02	8.00	42	53.10	79	0.70	42	57.40	78	54.80	0.002
285	0.16383D+01	0.14978D+01	8.00	42	54.40	78	54.80	42	54.40	78	51.70	0.005
286	-0.14707D+02	-0.15168D+02	8.00	42	54.40	78	54.70	42	55.90	78	54.90	0.007
287	0.22098D+01	0.21253D+01	8.00	42	55.90	78	54.90	42	56.20	78	55.10	0.033

288	0.26670D+00	0.14644D+00	8.00	42	56.20	78	55.10	42	56.70	78	55.90	0.015
289	0.32385D+01	0.32153D+01	8.00	42	56.70	78	55.90	42	56.90	78	56.80	0.017
290	0.41709D+01	0.43147D+01	19.00	49	0.20	88	12.50	49	1.20	88	15.00	0.031
291	0.29905D+01	0.31342D+01	53.00	49	0.20	88	12.50	49	1.20	88	15.00	0.238
292	-0.19438D+01	-0.20444D+01	53.00	48	59.60	88	1.50	49	1.20	88	2.30	0.280
293	-0.40257D+01	-0.40165D+01	53.00	48	58.20	87	59.90	48	59.60	88	1.50	0.256
294	0.35081D+01	0.36426D+01	53.00	48	56.10	87	55.00	48	57.30	87	57.50	0.226
295	0.75625D+01	0.79549D+01	53.00	48	55.40	87	50.80	48	56.10	87	55.00	0.159
296	0.18921D+01	0.21488D+01	53.00	48	54.30	87	43.10	48	55.30	87	46.40	0.191
297	-0.44397D+01	-0.37977D+01	53.00	48	52.30	87	35.40	48	54.30	87	43.10	0.084
298	0.43132D+00	0.96031D+00	53.00	48	50.10	87	25.40	48	50.10	87	29.90	0.153
299	-0.71120D+00	-0.81950D+00	3.00	48	51.40	89	57.70	48	52.00	89	58.30	0.002
300	0.23368D+01	0.21783D+01	3.00	48	50.50	89	56.80	48	51.40	89	57.70	0.001
301	0.40640D+01	0.39962D+01	3.00	48	50.00	89	56.10	48	50.50	89	56.80	0.002
302	-0.17475D+02	-0.17231D+02	3.00	49	57.50	93	23.80	49	58.10	93	21.40	0.001
303	0.29718D+01	0.16606D+01	60.00	48	36.80	93	23.80	48	38.30	93	21.50	0.278
304	-0.24384D+01	-0.20806D+01	3.00	48	37.50	89	53.90	48	36.00	89	53.90	0.001
305	0.10770D+02	0.10778D+02	3.00	48	36.00	89	53.90	48	35.20	89	52.30	0.001
306	-0.36576D+01	-0.40922D+01	5.00	49	24.60	91	38.60	49	24.90	91	39.20	0.005
307	0.20499D+01	0.29731D+01	51.00	50	14.10	90	45.40	50	14.40	90	42.70	0.233
308	0.74706D+00	0.22104D+01	51.00	50	14.40	90	42.70	50	14.40	90	39.30	0.187
309	0.11748D+01	0.39772D+01	48.00	49	46.10	91	14.10	49	44.20	91	9.60	0.107
310	-0.10130D+01	-0.10252D+01	34.00	48	26.10	89	13.20	48	26.10	89	13.10	2.833
311	0.29852D+01	0.30583D+01	34.00	48	26.10	89	13.20	48	25.80	89	13.30	0.633
312	-0.17302D+01	-0.17019D+01	34.00	48	25.80	89	13.30	48	25.60	89	13.20	0.922
313	-0.51099D+00	-0.44210D+00	34.00	48	25.60	89	13.20	48	25.20	89	13.10	0.480
314	-0.10758D+00	-0.78688D-01	34.00	48	23.60	89	13.90	48	23.70	89	14.30	0.666
315	0.25280D+01	0.25512D+01	34.00	48	23.10	89	14.70	48	22.90	89	14.80	0.922
316	0.10130D+01	0.10538D+01	34.00	48	22.90	89	14.80	48	22.70	89	14.80	0.975
317	0.16316D+01	0.16192D+01	34.00	48	22.70	89	14.80	48	22.70	89	14.70	2.833
318	-0.12931D+00	-0.12406D+01	49.50	48	42.00	80	47.00	48	46.10	80	48.00	0.099
319	-0.29916D+01	-0.23337D+01	54.00	47	58.80	84	50.20	47	57.50	84	53.80	0.176
320	0.56083D+00	0.80117D+00	50.00	49	17.50	81	47.50	49	16.50	81	44.50	0.184
321	-0.25043D+01	-0.22508D+01	37.00	48	15.00	82	26.50	48	14.00	82	25.50	0.190
322	-0.24714D-01	0.44446D-01	37.00	48	15.30	82	27.00	48	15.00	82	26.50	0.506
323	-0.94735D+00	0.21461D+00	37.00	48	15.30	82	27.00	48	10.00	82	16.00	0.025
324	-0.32622D+01	-0.29014D+01	37.00	48	10.00	82	16.00	48	8.50	82	13.80	0.108
325	0.12604D+01	0.17546D+01	37.00	48	12.00	82	18.50	48	10.00	82	16.00	0.088
326	0.18593D+01	0.19412D+01	50.00	48	28.80	81	19.50	48	28.50	81	19.50	1.405
327	-0.10633D+01	-0.11455D+01	43.00	46	30.70	84	21.60	46	30.80	84	21.00	0.734
328	-0.16625D+01	-0.15936D+01	11.00	46	20.50	83	53.30	46	20.80	83	55.10	0.016
329	0.15794D+01	0.13513D+01	11.00	46	31.00	84	5.80	46	32.70	84	9.40	0.007
330	-0.45720D+00	-0.37500D+00	10.00	46	30.80	84	21.00	46	30.70	84	21.60	0.040
331	-0.66751D+01	-0.64563D+01	10.00	46	31.20	84	25.40	46	31.20	84	28.00	0.009
332	0.70104D+01	0.71280D+01	10.00	46	31.60	84	32.50	46	31.60	84	33.90	0.018
333	0.63177D+01	0.64240D+01	11.00	46	16.00	83	33.10	46	16.10	83	34.60	0.020
334	-0.83127D-01	-0.23646D+00	11.00	46	16.10	83	34.60	46	17.10	83	36.10	0.014
335	0.72044D+01	0.73656D+01	11.00	46	17.10	83	36.10	46	17.10	83	37.90	0.016
336	-0.83127D+01	-0.81873D+01	11.00	46	17.10	83	37.90	46	17.10	83	39.30	0.021
337	-0.56804D+01	-0.54542D+01	11.00	46	17.10	83	39.30	46	17.00	83	41.50	0.013
338	0.96982D+00	0.97863D+00	11.00	46	17.00	83	41.50	46	17.40	83	42.90	0.020
339	0.40178D+01	0.40796D+01	11.00	46	17.40	83	42.90	46	17.80	83	44.90	0.014
340	-0.71212D+01	-0.70487D+01	11.00	46	17.80	83	44.90	46	18.10	83	46.70	0.016
341	-0.16625D+01	-0.16439D+01	11.00	46	18.00	83	47.50	46	18.30	83	48.70	0.023
342	-0.66502D+01	-0.66585D+01	11.00	46	18.30	83	48.70	46	18.90	83	50.60	0.014
343	-0.67887D+01	-0.68040D+01	11.00	46	18.90	83	50.60	46	19.40	83	52.10	0.018
344	0.19396D+01	0.21255D+01	11.00	46	19.40	83	52.10	46	20.20	83	56.90	0.006
345	-0.16625D+01	-0.14860D+01	11.00	46	20.20	83	56.90	46	20.20	83	58.90	0.015
346	-0.22167D+01	-0.20490D+01	11.00	46	20.20	83	58.90	46	20.20	84	0.80	0.016
347	-0.39901D+01	-0.48820D+01	11.00	46	25.60	84	4.10	46	28.50	84	4.10	0.007
348	-0.89941D-01	-0.15397D+00	61.00	45	19.00	79	59.40	45	20.40	80	1.80	0.290

349	-0.17489D+00	-0.17104D+00	61.00	45	20.40	80	1.80	45	20.60	80	2.30	1.577
350	-0.21486D+00	-0.69684D+00	61.00	45	20.60	80	2.30	45	24.40	80	5.00	0.148
351	0.13991D+01	0.12885D+01	61.00	45	24.40	80	5.00	45	25.80	80	6.80	0.336
352	0.64957D-01	0.17471D-01	61.00	45	25.80	80	6.80	45	28.30	80	11.80	0.148
353	0.10543D+01	0.10629D+01	61.00	45	28.30	80	11.80	45	29.70	80	15.00	0.240
354	0.20780D+01	0.18259D+01	61.00	45	29.70	80	15.00	45	33.10	80	19.50	0.136
355	-0.19387D+01	-0.21802D+01	61.00	45	33.10	80	19.50	45	35.80	80	22.60	0.182
356	0.95437D+00	0.55483D+00	61.00	45	35.80	80	22.60	45	40.10	80	27.40	0.116
357	-0.22985D+00	-0.61603D+00	61.00	45	40.10	80	27.40	45	43.00	80	29.30	0.197
358	0.11193D+01	0.66658D+00	61.00	45	43.00	80	29.30	45	46.50	80	31.80	0.161
359	0.25983D+00	-0.61962D+00	61.00	45	46.50	80	31.80	45	51.90	80	33.60	0.113
360	0.47969D+00	0.72834D-01	61.00	45	51.90	80	33.60	45	53.30	80	31.90	0.344
361	0.27482D+00	-0.32708D+00	61.00	45	53.30	80	31.90	45	56.20	80	31.30	0.214
362	-0.41972D+00	-0.12561D+01	61.00	45	56.20	80	31.30	46	2.70	80	36.50	0.085
363	0.60460D+00	0.33348D+00	61.00	46	2.70	80	36.50	46	5.10	80	39.00	0.212
364	-0.12442D+01	-0.15272D+01	61.00	46	5.10	80	39.00	46	7.10	80	40.40	0.283
365	0.12942D+01	0.10597D+01	61.00	46	7.10	80	40.40	46	8.80	80	41.70	0.327
366	-0.14990D-01	-0.67593D+00	61.00	46	8.80	80	41.70	46	13.20	80	44.50	0.131
367	-0.76450D+00	-0.10434D+01	61.00	46	13.20	80	44.50	46	15.30	80	46.40	0.254
368	0.13491D+00	-0.37003D-01	61.00	46	15.30	80	46.50	46	16.30	80	46.90	0.605
369	0.11343D+01	0.74788D+00	61.00	46	16.30	80	46.90	46	18.50	80	47.70	0.277
370	-0.94938D-01	-0.63057D+00	61.00	46	18.50	80	47.70	46	21.10	80	47.60	0.241
371	-0.23485D+00	-0.78163D+00	61.00	46	21.10	80	47.60	46	24.50	80	49.70	0.170
372	0.74645D+00	0.62578D+00	49.00	46	26.70	80	19.90	46	26.20	80	16.50	0.169
373	0.43729D+01	0.43030D+01	49.00	46	25.80	80	13.20	46	25.30	80	10.60	0.219
374	-0.57041D+01	-0.59862D+01	49.00	46	25.30	80	10.60	46	21.90	79	56.10	0.038
375	-0.14854D+02	-0.14914D+02	49.00	46	21.90	79	56.10	46	22.10	79	55.70	1.190
376	-0.82420D+01	-0.87924D+01	49.00	46	21.90	79	56.10	46	22.10	79	47.50	0.068
377	-0.37944D+01	-0.38189D+01	49.00	46	19.50	79	29.90	46	19.00	79	28.00	0.289
378	0.55984D+00	0.20149D+00	49.00	46	22.10	79	47.50	46	21.30	79	39.00	0.069
379	-0.32346D+01	-0.34521D+01	49.00	46	21.30	79	39.00	46	19.50	79	29.90	0.062
380	0.10160D+01	0.15817D+01	55.50	46	17.60	81	41.60	46	16.90	81	46.50	0.151
381	-0.12631D+01	-0.52662D+00	55.50	46	16.90	81	46.50	46	16.00	81	52.80	0.117
382	-0.10352D+02	-0.94364D+01	55.50	46	16.00	81	52.80	46	14.00	81	58.00	0.127
383	0.98854D+01	0.10479D+02	55.50	46	14.00	81	58.00	46	13.10	82	2.40	0.164
384	0.51624D+01	0.53663D+01	55.50	46	13.10	82	2.40	46	12.90	82	4.20	0.414
385	-0.46406D+01	-0.43354D+01	55.50	46	12.90	82	4.20	46	12.50	82	6.60	0.306
386	0.27075D+01	0.43408D+01	55.50	46	12.50	82	6.60	46	12.30	82	24.60	0.042
387	0.32567D+01	0.49615D+01	55.50	46	12.30	82	24.60	46	11.90	82	42.50	0.042
388	0.33281D+01	0.48821D+01	55.50	46	11.90	82	42.50	46	11.10	82	57.30	0.051
389	-0.67112D+00	-0.65646D+00	54.50	46	30.70	84	19.60	46	30.60	84	19.40	2.944
390	-0.96473D+01	-0.97672D+01	54.50	46	30.60	84	19.40	46	31.30	84	20.60	0.463
391	-0.38100D+01	-0.42161D+01	54.00	46	31.30	84	20.60	46	32.90	84	21.80	0.273
392	0.24666D+01	0.17529D+01	54.00	46	34.60	84	19.40	46	36.30	84	17.30	0.220
393	0.12644D+01	0.53405D+00	54.00	46	36.30	84	17.30	46	38.80	84	18.10	0.192
394	-0.27771D+01	-0.21192D+01	54.00	47	58.80	84	50.20	47	57.50	84	53.80	0.176
395	-0.67377D+00	-0.10807D+00	47.50	46	17.60	81	41.60	46	16.90	81	46.50	0.110
396	0.12644D+01	0.53405D+00	54.00	46	36.30	84	17.30	46	38.80	84	18.10	0.192
397	-0.21866D+00	-0.28364D+00	46.00	45	0.50	75	38.30	45	0.80	75	38.50	1.081
398	-0.38895D+01	-0.40667D+01	46.00	45	0.60	75	34.40	45	0.50	75	38.30	0.133
399	-0.18089D+01	-0.18163D+01	46.00	45	3.10	75	26.30	45	2.10	75	29.70	0.140
400	0.72887D+00	0.77289D+00	46.00	45	6.30	75	13.80	45	6.10	75	13.70	1.687
401	0.10270D+01	0.90935D+00	46.00	45	4.90	75	20.70	45	5.40	75	21.10	0.625
402	-0.19678D+00	-0.24221D+00	46.00	45	5.40	75	21.10	45	5.60	75	21.20	1.687
403	-0.80772D+01	-0.80772D+01	4.00	45	2.50	79	20.00	45	2.50	79	20.00	0.050
404	-0.38862D+01	-0.39300D+01	4.00	45	2.50	79	20.00	45	2.80	79	20.20	0.008
405	0.10211D+02	0.10123D+02	2.00	45	6.30	79	20.20	45	6.80	79	20.30	0.001
406	0.21336D+01	0.21855D+01	4.00	45	18.50	79	57.70	45	18.70	79	58.80	0.003
407	-0.98292D+01	-0.98692D+01	4.00	45	18.70	79	58.80	45	19.00	79	59.00	0.008
408	-0.91440D+01	-0.92784D+01	4.00	45	19.00	79	59.00	45	19.90	79	59.40	0.003
409	0.16002D+01	0.15563D+01	4.00	45	19.90	79	59.40	45	20.40	80	0.0	0.004

410	0.69342D+01	0.68372D+01	4.00	45	20.90	80	0.50	45	21.60	80	0.90	0.004
411	-0.32232D+00	0.11666D-03	43.50	45	27.10	80	1.00	45	25.70	80	1.80	0.133
412	-0.88287D+00	-0.60406D+00	43.50	45	25.70	80	1.80	45	24.10	80	1.60	0.124
413	0.49048D-01	0.27884D+00	43.50	45	24.10	80	1.60	45	22.90	80	1.70	0.166
414	0.12835D+01	0.22534D+01	43.50	45	22.90	80	1.70	45	20.60	80	1.60	0.087
415	0.25706D+01	0.24945D+01	41.50	45	51.30	77	12.60	45	51.90	77	13.80	0.173
416	0.89163D+01	0.86587D+01	41.50	45	51.90	77	13.80	45	53.90	77	17.00	0.061
417	0.16232D+01	0.10266D+01	41.50	45	53.90	77	17.00	45	58.60	77	23.00	0.029
418	0.15130D+01	0.13689D+01	41.50	45	58.60	77	23.00	45	59.90	77	25.40	0.086
419	0.62429D+00	0.49518D+00	41.50	45	59.90	77	25.40	46	1.00	77	26.90	0.120
420	-0.70508D+00	-0.71938D+00	41.50	46	1.00	77	26.90	46	1.10	77	26.90	1.815
421	-0.50678D+00	-0.12763D+01	41.50	46	1.10	77	26.90	46	7.40	77	32.30	0.025
422	0.12412D+01	0.10966D+01	41.50	46	7.40	77	32.30	46	8.80	77	34.40	0.090
423	-0.31508D+01	-0.32471D+01	41.50	46	8.80	77	34.40	46	10.00	77	37.30	0.078
424	0.34520D+01	0.34612D+01	41.50	46	10.00	77	37.30	46	10.00	77	37.70	0.659
425	0.72711D+00	0.62518D+00	41.50	46	10.00	77	37.70	46	10.90	77	38.50	0.172
426	-0.25339D+01	-0.25472D+01	41.50	46	11.40	77	41.00	46	11.50	77	41.00	1.815
427	0.32431D+01	0.33577D+01	37.50	44	46.50	79	20.30	44	45.80	79	19.90	0.197
428	-0.12090D+02	-0.12056D+02	3.00	46	18.10	79	24.30	46	18.30	79	25.50	0.002
429	0.38608D+01	0.38774D+01	3.00	46	18.30	79	25.50	46	18.30	79	25.80	0.007
430	0.95504D+01	0.99569D+01	3.00	42	16.30	82	25.80	42	16.60	82	22.70	0.001
431	-0.12192D+01	-0.11649D+01	3.00	42	16.60	82	22.70	42	16.80	82	22.40	0.005
432	0.83820D+01	0.83266D+01	2.00	42	21.50	82	7.80	42	22.10	82	8.50	0.001
433	-0.11278D+02	-0.11281D+02	2.00	42	22.10	82	8.50	42	22.00	82	8.50	0.007
434	-0.50800D+01	-0.50761D+01	9.00	42	59.10	82	24.20	42	59.20	82	23.70	0.038
435	-0.25739D+01	-0.25585D+01	9.00	42	59.20	82	23.70	42	59.20	82	21.50	0.009
436	0.51368D+01	0.54900D+01	34.00	42	57.50	81	37.90	42	55.10	81	31.20	0.038
437	-0.17929D-01	0.76499D-01	34.00	42	55.10	81	31.20	42	54.50	81	29.70	0.163
438	-0.56478D+00	-0.56266D+00	34.00	42	54.50	81	29.70	42	54.50	81	29.60	2.833
439	0.32512D+01	0.32491D+01	3.00	42	54.50	81	29.60	42	54.50	81	29.70	0.022
440	0.26572D+00	0.29025D+00	39.00	42	46.80	81	11.70	42	46.50	81	12.20	0.562
441	0.26963D+01	0.35235D+01	39.00	42	46.50	81	12.20	42	40.40	81	12.80	0.042
442	0.32886D+00	0.35339D+00	38.00	42	46.80	81	11.70	42	46.50	81	12.20	0.533
443	-0.35560D+01	-0.35565D+01	3.00	42	53.10	80	6.70	42	53.10	80	6.90	0.011
444	0.55880D+01	0.58960D+01	3.00	42	53.10	80	6.90	42	51.90	80	7.70	0.001
445	0.14783D+02	0.14800D+02	2.00	43	10.00	80	15.90	43	10.00	80	16.90	0.001
446	-0.96774D+01	-0.96746D+01	4.00	43	15.40	79	56.10	43	15.40	79	56.20	0.039
447	-0.21539D+01	-0.21502D+01	15.00	43	9.90	79	11.70	43	9.90	79	11.80	0.551
448	-0.34466D+01	-0.35331D+01	13.00	43	21.80	80	58.60	43	22.30	80	58.60	0.057
449	-0.51582D+00	-0.51830D+00	13.00	43	22.30	80	58.60	43	22.40	80	59.10	0.080
450	-0.31652D+01	-0.31825D+01	13.00	43	22.40	80	59.10	43	22.50	80	59.10	0.285
451	-0.58211D+01	-0.53362D+01	51.00	43	24.60	80	39.30	43	22.70	80	42.80	0.143
452	0.17690D+01	0.23151D+01	51.00	43	22.70	80	42.80	43	22.30	80	58.60	0.040
453	0.10220D+01	0.11085D+01	51.00	43	22.30	80	58.60	43	21.80	80	58.60	0.877
454	0.63500D-02	-0.17910D+00	48.00	43	26.40	80	29.50	43	27.30	80	29.60	0.430
455	-0.14605D+00	-0.24636D+00	48.00	43	27.30	80	29.60	43	28.10	80	31.40	0.263
456	-0.12764D+01	-0.12215D+01	48.00	43	28.10	80	31.40	43	27.80	80	31.20	1.177
457	0.19771D+00	0.24643D+00	37.00	43	26.70	80	29.90	43	26.40	80	29.50	0.567
458	-0.15240D+02	-0.15325D+02	1.00	43	28.10	80	31.40	43	28.40	80	30.80	0.000
459	-0.70104D+01	-0.71394D+01	1.00	43	29.20	80	31.50	43	29.90	80	31.90	0.000
460	-0.16764D+02	-0.16714D+02	1.00	43	37.50	80	8.50	43	37.30	80	8.60	0.001
461	0.0	0.46556D-01	4.00	43	28.70	80	25.70	43	28.50	80	25.80	0.013
462	-0.29718D+01	-0.29428D+01	4.00	43	28.50	80	25.80	43	28.40	80	26.00	0.016
463	0.0	0.32695D-01	4.00	43	28.40	80	26.00	43	28.30	80	26.30	0.012
464	0.0	0.75603D-02	4.00	43	28.30	80	26.30	43	28.30	80	26.50	0.020
465	-0.45720D+00	-0.35958D+00	4.00	43	28.30	80	26.50	43	28.00	80	27.40	0.004
466	-0.38100D+00	-0.36241D+00	4.00	43	27.80	80	28.00	43	27.80	80	28.50	0.008
467	0.0	-0.38474D-01	4.00	43	27.60	80	28.50	43	27.80	80	28.60	0.013
468	-0.20683D+01	-0.20183D+01	14.00	43	37.50	80	8.50	43	37.30	80	8.60	0.156
469	-0.69233D+01	-0.65011D+01	14.00	43	37.30	80	8.60	43	35.80	80	10.40	0.017
470	-0.45938D+01	-0.41884D+01	14.00	43	35.80	80	10.40	43	34.30	80	11.90	0.018

471	0.40930D+01	0.46223D+01	14.00	43	34.30	80	11.90	43	32.50	80	14.80	0.012
472	-0.75184D+01	-0.74291D+01	3.00	43	49.80	80	32.00	43	49.80	80	33.50	0.001
473	0.12023D+01	0.11646D+01	18.00	43	58.80	80	44.30	43	59.00	80	44.30	0.273
474	-0.10886D-01	0.15107D-01	56.00	43	42.30	80	22.80	43	42.30	80	23.30	1.537
475	0.80010D+01	0.80010D+01	4.00	43	17.90	79	47.80	43	17.90	79	47.80	0.050
476	0.14859D+02	0.15005D+02	4.00	43	17.90	79	47.80	43	17.30	79	47.50	0.004
477	0.11430D+02	0.11568D+02	4.00	43	17.30	79	47.50	43	16.70	79	46.90	0.004
478	0.38100D+01	0.40303D+01	4.00	43	16.70	79	46.90	43	15.80	79	46.40	0.003
479	-0.58347D+01	-0.56484D+01	7.00	43	5.30	79	56.80	43	4.60	79	57.00	0.012
480	-0.45285D+01	-0.44991D+01	7.00	43	4.60	79	57.00	43	4.50	79	57.20	0.049
481	0.15240D+01	0.15634D+01	9.00	43	15.50	79	54.80	43	15.40	79	55.30	0.038
482	-0.19543D+01	-0.23775D+01	17.00	44	30.70	80	55.20	44	33.80	80	56.80	0.009
483	0.15240D+01	0.15331D+01	1.00	44	33.80	80	56.80	44	33.80	80	56.90	0.002
484	0.32512D+00	0.33421D+00	45.00	44	33.80	80	56.80	44	33.80	80	56.90	3.101
485	0.56444D-01	0.99244D-01	27.00	43	50.20	80	50.90	43	50.00	80	51.00	0.581
486	0.73378D+00	0.65435D+00	27.00	43	50.00	80	51.00	43	50.40	80	50.90	0.303
487	0.25400D+01	0.30510D+01	27.00	43	50.40	80	50.90	43	48.40	80	53.30	0.047
488	0.92082D+01	0.81330D+01	38.00	42	1.70	82	36.20	42	2.30	82	43.30	0.049
489	0.36857D+00	0.15181D+00	38.00	42	2.30	82	43.30	42	2.20	82	44.50	0.293
490	-0.11470D+01	-0.98747D+00	38.00	42	16.80	83	1.10	42	17.70	83	1.40	0.264
491	0.16256D+01	0.15983D+01	3.00	42	24.40	82	10.90	42	24.20	82	11.10	0.006
492	-0.30480D+00	-0.28737D+00	3.00	42	24.20	82	11.10	42	24.40	82	11.00	0.007
493	-0.63190D+00	-0.61808D+00	41.00	42	40.50	81	12.80	42	40.40	81	12.80	2.835
494	-0.11009D+02	-0.10881D+02	8.50	44	5.80	81	17.80	44	5.50	81	18.80	0.016
495	-0.22167D+00	-0.24106D+00	11.00	44	15.70	80	33.00	44	15.80	80	33.00	0.204
496	-0.61976D+01	-0.61915D+01	3.00	43	55.30	80	5.60	43	55.30	80	5.70	0.022
497	0.46736D+01	0.46700D+01	3.00	43	55.30	80	5.70	43	55.40	80	6.00	0.007
498	0.0	0.10070D+00	11.00	44	18.10	82	48.70	44	18.00	83	47.50	0.036
499	0.24384D+01	0.25322D+01	1.00	44	1.00	79	40.00	44	0.80	79	40.80	0.000
500	0.18390D+01	0.14968D+01	60.00	43	50.30	79	42.00	43	51.80	79	42.20	0.403
501	-0.46736D+01	-0.47938D+01	6.00	43	41.30	79	46.30	43	41.80	79	46.30	0.012
502	-0.74168D+01	-0.74865D+01	6.00	43	41.80	79	46.30	43	42.30	79	47.30	0.007
503	-0.98323D+01	-0.10113D+02	31.00	44	4.30	79	28.90	44	5.70	79	29.60	0.068
504	0.80865D+00	0.30032D+00	49.00	44	1.40	79	48.30	44	3.70	79	48.40	0.176
505	0.32657D+00	0.38841D+00	42.00	44	36.70	79	24.80	44	36.50	79	25.10	1.035
506	-0.12005D+01	-0.28446D+01	49.00	44	43.80	79	36.70	44	51.80	79	36.00	0.051
507	0.22082D+01	0.17519D+01	49.00	44	51.80	79	36.00	44	54.20	79	36.20	0.168
508	-0.22497D+01	-0.18811D+01	42.00	43	44.00	79	19.60	43	42.80	79	20.90	0.199
509	-0.43906D+01	-0.42324D+01	42.00	43	42.80	79	20.90	43	42.00	79	20.00	0.294
510	0.70394D+01	0.75169D+01	42.00	43	42.00	79	20.00	43	40.80	79	23.50	0.111
511	-0.40640D+00	-0.66315D+00	6.00	43	40.00	79	28.30	43	41.00	79	28.20	0.006
512	-0.74894D+01	-0.76560D+01	3.50	44	1.00	79	35.50	44	1.80	79	35.80	0.003
513	-0.54443D+01	-0.65933D+01	3.50	44	1.80	79	35.80	44	2.50	79	36.00	0.003
514	0.99753D+00	0.11313D+01	11.00	44	3.50	79	27.70	44	3.00	79	28.00	0.038
515	0.26324D+01	0.25391D+01	11.00	44	3.00	79	28.00	44	3.30	79	27.60	0.050
516	-0.78334D+01	-0.72132D+01	10.00	44	23.40	79	6.60	44	20.30	79	5.40	0.005
517	0.66142D+01	0.64605D+01	10.00	44	20.30	79	5.40	44	20.70	79	4.30	0.020
518	-0.16429D+01	-0.17941D+01	41.00	44	29.30	79	9.00	44	30.00	79	9.00	0.253
519	0.85047D+01	0.81365D+01	41.00	44	30.00	79	9.00	44	32.00	79	10.00	0.084
520	0.24267D+01	0.21745D+01	52.00	44	32.00	79	10.00	44	35.00	79	16.10	0.088
521	0.32431D+01	0.33172D+01	37.50	44	46.50	79	20.30	44	46.00	79	19.90	0.260
522	0.48006D+01	0.47629D+01	8.00	44	18.30	77	57.30	44	18.50	77	57.50	0.044
523	0.60158D+01	0.52753D+01	38.00	43	58.80	78	37.00	44	1.80	78	36.90	0.051
524	-0.59516D+01	-0.64512D+01	38.00	44	1.80	78	36.90	44	4.00	78	37.60	0.068
525	0.62702D+01	0.61404D+01	7.00	44	22.80	77	59.00	44	23.30	77	58.50	0.014
526	-0.18898D+00	0.62002D+00	50.00	44	25.90	77	53.80	44	23.10	77	59.10	0.092
527	-0.10485D+01	-0.80619D+00	50.00	44	23.10	77	59.10	44	22.40	78	1.40	0.244
528	-0.84526D+01	-0.85480D+01	41.00	44	18.50	79	5.00	44	19.00	79	5.30	0.328
529	-0.17099D+00	-0.96789D-01	41.00	44	15.90	79	4.30	44	15.50	79	4.00	0.394
530	0.91143D+01	0.97776D+01	41.00	44	15.50	79	4.00	44	12.20	79	2.30	0.051
531	-0.73070D+01	-0.67227D+01	41.00	44	12.20	79	2.30	44	9.00	79	1.00	0.053

532	0.79397D+01	0.85116D+01	41.00	44	9.00	79	1.00	44	6.30	78	59.80	0.063
533	-0.16561D+02	-0.16711D+02	3.00	44	16.90	78	42.20	44	17.60	78	42.40	0.002
534	0.67056D+01	0.63808D+01	3.00	44	17.60	78	42.40	44	19.20	78	43.20	0.001
535	0.19304D+01	0.17690D+01	3.00	44	19.20	78	43.20	44	20.00	78	43.60	0.002
536	-0.52832D+01	-0.54492D+01	3.00	44	20.00	78	43.60	44	20.80	78	43.90	0.002
537	-0.13919D+02	-0.13978D+02	3.00	44	20.80	78	43.90	44	21.20	78	44.50	0.003
538	-0.38629D+01	-0.44800D+01	49.00	44	39.50	78	47.90	44	42.50	78	48.10	0.135
539	0.18848D+01	0.16784D+01	49.00	44	42.50	78	48.10	44	43.60	78	48.50	0.357
540	-0.30169D+01	-0.36240D+01	49.00	44	43.60	78	48.50	44	46.60	78	48.70	0.135
541	-0.16111D+01	-0.22648D+01	49.00	44	46.60	78	48.70	44	48.30	78	43.10	0.096
542	0.77133D+00	0.76917D+00	49.00	44	48.30	78	43.10	44	49.30	78	46.80	0.148
543	0.12845D+01	0.10727D+01	14.00	44	31.30	78	46.40	44	32.50	78	47.30	0.024
544	-0.15240D+01	-0.16105D+01	14.00	44	32.50	78	47.30	44	32.90	78	47.30	0.083
545	-0.12878D+01	-0.13101D+01	40.00	44	25.20	78	16.40	44	25.30	78	16.40	1.686
546	0.28448D+01	0.23124D+01	30.00	44	32.30	78	32.70	44	34.40	78	31.10	0.040
547	0.63190D+00	0.19121D+00	41.00	44	30.20	78	44.50	44	32.20	78	44.40	0.142
548	0.11151D+01	0.10881D+01	41.00	44	32.20	78	44.40	44	32.30	78	44.30	2.335
549	0.20955D+01	0.21058D+01	8.00	44	26.00	77	53.50	44	26.00	77	53.80	0.052
550	-0.48387D+01	-0.47774D+01	8.00	44	26.00	77	53.80	44	25.80	77	54.30	0.027
551	0.10488D+02	0.10730D+02	49.00	44	23.10	77	59.10	44	22.40	78	1.40	0.234
552	0.83820D+01	0.85517D+01	2.00	44	33.30	77	19.30	44	32.50	77	19.50	0.001
553	0.25831D-01	0.51528D-01	59.00	44	54.20	76	15.40	44	54.10	76	15.10	2.559
554	0.20664D+00	0.40771D+00	59.00	44	54.10	76	15.10	44	52.20	76	22.80	0.104
555	0.28930D+00	0.40954D+00	59.00	44	52.20	76	22.80	44	51.30	76	25.80	0.261
556	-0.26709D+01	-0.26841D+01	59.00	44	43.00	76	53.60	44	43.10	76	55.80	0.387
557	0.45462D+00	0.58641D+00	59.00	44	43.10	76	55.80	44	42.50	76	58.70	0.282
558	0.45443D+01	0.44060D+01	11.00	44	38.80	77	7.50	44	39.50	77	7.80	0.028
559	0.30460D+00	0.34657D+00	5.00	44	28.70	77	13.70	44	28.50	77	13.70	0.021
560	0.38481D+01	0.40021D+01	8.00	44	33.30	78	13.10	44	32.80	78	14.20	0.012
561	0.64770D+00	0.64353D+00	8.00	44	32.80	78	14.20	44	32.80	78	14.10	0.157
562	-0.38100D-01	-0.59785D-01	8.00	44	32.80	78	14.10	44	32.90	78	14.10	0.108
563	0.27432D+01	0.29565D+01	8.00	44	19.00	78	18.90	44	18.30	78	20.10	0.010
564	-0.15773D+02	-0.16120D+02	8.00	44	19.30	78	20.10	44	21.20	78	22.00	0.005
565	0.16764D+01	0.16987D+01	8.00	44	25.30	78	16.40	44	25.20	78	16.40	0.108
566	-0.20574D+01	-0.18149D+01	8.00	44	25.20	78	16.40	44	24.00	78	15.80	0.009
567	0.50673D+01	0.50807D+01	8.00	44	33.50	78	12.50	44	33.40	78	12.30	0.063
568	-0.52959D+01	-0.53351D+01	8.00	44	33.40	78	12.30	44	33.60	78	12.40	0.051
569	-0.47244D+01	-0.47963D+01	8.00	44	33.60	78	12.40	44	34.20	78	13.80	0.010
570	-0.47244D+01	-0.46329D+01	8.00	44	33.80	78	20.40	44	33.50	78	21.00	0.021
571	0.57912D+01	0.58212D+01	8.00	44	33.50	78	21.00	44	33.30	78	20.70	0.038
572	0.14859D+01	0.13409D+01	8.00	44	15.90	77	47.60	44	16.50	77	47.30	0.017
573	-0.63782D+00	-0.14822D+01	54.00	44	11.70	78	46.60	44	14.90	78	44.70	0.142
574	-0.46172D+01	-0.45877D+01	54.00	44	21.10	78	43.50	44	21.20	78	44.50	0.707
575	-0.21844D+01	-0.21902D+01	12.00	44	35.80	78	56.30	44	35.80	78	56.20	0.353
576	0.87884D+01	0.88367D+01	12.00	44	35.80	78	56.20	44	35.60	78	56.30	0.115
577	-0.47383D+01	-0.48461D+01	11.00	44	46.20	79	21.00	44	46.50	79	20.30	0.036
578	0.66779D+01	0.68942D+01	11.00	44	46.50	79	20.30	44	46.10	79	22.30	0.014
579	-0.33251D+00	-0.34160D+00	44.00	44	33.80	80	56.90	44	33.80	80	56.80	2.965
580	-0.91440D+00	-0.98844D+00	13.00	42	26.70	82	14.10	42	27.70	82	15.40	0.021
581	-0.98474D+00	-0.10756D+01	13.00	42	27.70	82	15.40	42	29.30	82	17.30	0.014
582	-0.15006D+02	-0.15058D+02	13.00	42	29.30	82	17.30	42	30.10	82	18.40	0.026
583	0.11151D+02	0.10245D+02	12.00	42	2.20	82	45.30	42	1.20	82	49.50	0.008
584	-0.90424D+01	-0.91320D+01	12.00	42	1.20	82	49.50	42	0.80	82	49.50	0.061
585	0.45720D+00	-0.19525D+00	44.00	44	40.80	81	8.10	44	44.50	81	8.30	0.055
586	0.17249D+01	0.17670D+01	44.00	45	10.40	81	31.10	45	12.70	81	35.80	0.051
587	0.57496D+00	-0.28794D+00	44.00	44	33.80	80	56.80	44	35.00	80	49.70	0.041
588	-0.26324D+00	-0.14632D+00	44.00	44	33.90	80	26.60	44	33.60	80	27.30	0.360
589	0.22860D+00	0.21176D+00	44.00	44	33.60	80	27.30	44	33.60	80	27.10	1.482
590	-0.17788D+01	-0.26833D+01	61.00	42	19.50	82	25.90	42	18.30	82	32.70	0.128
591	-0.25589D+01	-0.51097D+01	43.00	44	28.00	60	6.40	44	35.20	79	52.10	0.016
592	-0.13539D+01	-0.24528D+01	43.00	44	41.10	79	57.20	44	45.30	79	53.80	0.041

593	-0.49619D+00	-0.50107D+00	43.00	44	45.30	79	53.80	44	46.20	79	56.00	0.111
594	-0.14035D+01	-0.13909D+01	43.00	44	45.30	79	53.80	44	45.00	79	53.20	0.382
595	0.48768D+00	0.92360D-01	10.00	44	42.60	79	38.70	44	42.70	79	33.50	0.005
596	-0.13252D+01	-0.13106D+01	11.50	46	30.50	84	19.70	46	30.40	84	19.50	0.131
597	-0.50358D+01	-0.49858D+01	11.50	46	16.90	83	32.90	46	17.10	83	34.10	0.026
598	-0.58220D+00	-0.53222D+00	44.50	46	16.90	83	32.90	46	17.10	83	34.10	0.393
599	0.70207D+01	0.77799D+01	44.50	46	16.90	83	32.90	46	20.50	83	53.30	0.023
600	0.82573D+01	0.98287D+01	11.00	46	32.70	84	9.40	46	30.40	84	19.50	0.003
601	0.10850D+02	0.11219D+02	54.50	46	31.60	84	20.60	46	30.70	84	21.60	0.442
602	-0.54187D+01	-0.53651D+01	9.00	46	28.40	80	51.70	46	28.70	80	53.40	0.011
603	-0.11176D+02	-0.11298D+02	9.00	46	29.30	80	59.60	46	30.00	81	0.0	0.018
604	0.51075D+01	0.47515D+01	37.00	46	19.70	79	22.10	46	21.20	79	19.90	0.108
605	0.35423D+01	0.28785D+01	37.00	46	21.20	79	19.90	46	25.40	79	19.90	0.055
606	0.57253D+01	0.55571D+01	37.00	46	25.40	79	19.90	46	27.20	79	22.20	0.096
607	0.20183D+01	0.17971D+01	37.00	46	27.20	79	22.20	46	29.10	79	23.80	0.105
608	-0.11533D+01	-0.12584D+01	37.00	46	29.10	79	23.80	46	29.70	79	23.60	0.375
609	0.10709D+01	0.81591D+00	37.00	46	29.70	79	23.60	46	31.80	79	25.20	0.097
610	-0.26670D+01	-0.27587D+01	36.00	47	30.40	79	41.20	47	30.90	79	40.50	0.315
611	-0.12357D+00	-0.81241D-01	37.00	46	19.00	79	28.00	46	18.50	79	27.30	0.332
612	0.24302D+01	0.16857D+01	37.00	46	58.10	79	44.40	47	3.10	79	47.70	0.042
613	0.16064D+01	0.65780D+00	37.00	47	3.10	79	47.70	47	8.30	79	46.10	0.043
614	-0.37070D+00	-0.12062D+01	37.00	47	8.30	79	46.10	47	12.70	79	43.10	0.047
615	-0.91440D+01	-0.88918D+01	7.00	45	31.20	77	56.30	45	30.20	77	58.70	0.004
616	-0.65314D+01	-0.61028D+01	7.00	45	33.30	77	54.10	45	31.20	77	56.30	0.003
617	-0.39189D+01	-0.37493D+01	7.00	45	33.80	77	51.40	45	33.30	77	54.10	0.004
618	0.10450D+02	0.10352D+02	7.00	45	32.70	77	48.50	45	33.80	77	51.40	0.004
619	-0.63137D+01	-0.64541D+01	7.00	45	31.40	77	45.70	45	32.70	77	48.50	0.004
620	0.65314D+00	0.55250D+00	7.00	45	30.60	77	44.42	45	31.40	77	45.70	0.007
621	0.26894D+00	0.27030D+00	17.00	45	28.30	76	41.00	45	28.30	76	40.80	0.354
622	-0.40958D+01	-0.40427D+01	16.00	45	32.80	78	33.80	45	33.70	78	37.90	0.015
623	0.39858D+01	0.34330D+01	13.00	45	25.20	75	43.90	45	27.90	75	44.70	0.010
624	0.15943D+02	0.15985D+02	13.00	45	24.90	75	39.70	45	24.90	75	38.80	0.046
625	0.11723D+00	0.22920D+00	13.00	45	24.90	75	38.80	45	23.50	75	42.20	0.010
626	0.26126D+01	0.25687D+01	7.00	45	36.60	74	35.80	45	36.60	74	36.30	0.024
627	-0.65314D+00	-0.65314D+00	7.00	45	36.60	74	36.30	45	36.60	74	36.30	0.153
628	-0.10880D+01	-0.10845D+01	7.00	45	36.60	74	36.30	45	36.50	74	36.50	0.049
629	-0.19594D+01	-0.19943D+01	7.00	45	36.50	74	36.50	45	36.50	74	36.90	0.030
630	0.75329D+01	0.76919D+01	7.00	45	36.50	74	36.90	45	35.60	74	37.30	0.009
631	0.0	0.90037D-01	58.00	45	5.60	75	37.30	45	5.20	75	37.00	1.260
632	-0.84667D+00	-0.89718D+00	36.00	45	23.50	75	42.20	45	23.60	75	42.90	0.444
633	-0.45720D+01	-0.46015D+01	1.00	49	47.80	84	6.50	49	47.80	84	6.30	0.001
634	0.83820D+01	0.82181D+01	4.00	49	41.70	83	41.20	49	41.70	83	39.90	0.003
635	0.16764D+02	0.16782D+02	1.00	47	41.20	83	7.20	47	41.30	83	8.10	0.000
636	-0.24260D+00	-0.75351D+00	49.00	49	45.50	83	58.20	49	43.70	83	52.90	0.100
637	0.32160D+01	0.23523D+01	49.00	49	43.00	83	48.30	49	41.50	83	39.90	0.068
638	0.0	-0.83015D-02	42.00	44	42.60	75	31.00	44	42.80	75	30.50	0.747
639	0.50800D+00	0.48109D+00	42.00	44	42.60	75	30.60	44	42.80	75	30.50	1.406
640	-0.13063D+01	-0.13156D+01	42.00	44	42.60	75	30.60	44	42.60	75	30.80	2.161
641	0.21771D+00	0.27213D+00	42.00	44	13.80	76	29.00	44	13.50	76	29.30	0.817
642	-0.97971D+00	-0.98903D+00	14.00	44	42.60	75	30.60	44	42.60	75	30.80	0.240
643	0.38100D+01	0.37831D+01	14.00	44	42.60	75	30.60	44	42.80	75	30.50	0.156
644	0.87086D+00	0.85225D+00	14.00	44	42.60	75	30.60	44	42.60	75	31.00	0.120
645	-0.18506D+01	-0.18413D+01	14.00	44	42.60	75	31.00	44	42.60	75	30.80	0.240
646	0.47625D+00	0.45730D+00	16.00	45	8.30	76	8.60	45	8.40	76	8.60	0.432
647	-0.18288D+02	-0.17739D+02	2.00	44	22.40	78	1.40	44	21.00	78	7.40	0.000
648	-0.93133D+01	-0.90798D+01	9.00	44	18.50	78	19.20	44	17.50	78	19.30	0.014
649	-0.50800D+00	-0.42643D+00	9.00	44	17.50	78	19.30	44	17.30	78	20.10	0.023
650	0.10352D+01	0.10240D+01	53.00	45	30.90	75	32.70	45	30.00	75	36.50	0.171
651	-0.50800D+00	-0.50800D+00	12.00	45	33.50	75	25.30	45	33.50	75	25.30	0.450
652	-0.16510D+01	-0.16585D+01	12.00	45	32.70	75	25.50	45	32.60	75	26.00	0.069
653	-0.10015D+02	-0.99868D+01	7.00	45	35.20	75	24.80	45	35.10	75	25.00	0.034

654	0.326570+01	0.323570+01	7.00	45	35.30	75	24.80	45	35.40	75	25.00	0.049
655	-0.609600-01	-0.285080+00	10.00	45	36.00	75	25.20	45	37.00	75	25.80	0.016
656	-0.572910+01	-0.590080+01	54.00	45	36.30	75	10.40	45	35.80	75	14.80	0.160
657	0.242710+01	0.233830+01	54.00	45	36.30	75	9.00	45	36.30	75	10.40	0.510
658	0.451560+00	0.380170+00	54.00	45	36.20	75	8.20	45	36.30	75	9.00	0.879
659	0.423330+00	0.266990+00	54.00	45	36.90	75	3.70	45	36.20	75	8.20	0.155
660	-0.609600+00	-0.626060+00	20.00	45	43.90	76	51.40	45	44.00	76	51.30	0.556
661	-0.152400+01	-0.145930+01	20.00	45	44.00	76	51.30	45	43.60	76	50.70	0.117
662	-0.566060+01	-0.550200+01	7.00	45	31.00	78	11.40	45	30.50	78	13.20	0.006
663	0.134980+02	0.135040+02	7.00	45	30.50	78	9.10	45	31.00	78	11.40	0.005
664	0.117570+02	0.116890+02	7.00	45	29.50	78	6.40	45	30.50	78	9.10	0.004
665	-0.609600+01	-0.566850+01	7.00	45	31.30	78	3.20	45	29.50	78	6.40	0.003
666	0.283030+01	0.280670+01	7.00	45	30.70	78	1.00	45	31.30	78	3.20	0.005
667	-0.108860+01	-0.108040+01	7.00	45	30.30	77	58.80	45	30.70	78	1.00	0.005
668	0.348340+01	0.346970+01	7.00	45	30.20	77	58.70	45	30.30	77	58.80	0.058
669	-0.179290+01	-0.179290+01	17.00	48	36.70	93	24.10	48	36.70	93	24.10	0.903
670	-0.606550+01	-0.583670+01	50.00	48	43.50	94	32.00	48	43.40	94	28.10	0.157
671	0.110840+01	0.113280+01	22.00	48	26.10	89	13.20	48	26.10	89	13.40	0.593
672	-0.277090+00	-0.236290+00	22.00	48	23.10	89	14.70	48	22.90	89	14.70	0.408
673	0.159570+02	0.146220+02	17.00	49	2.10	95	38.50	49	2.10	95	43.30	0.015
674	-0.457200+01	-0.460150+01	1.00	49	47.80	84	6.50	49	47.80	84	6.30	0.001
675	0.121920+02	0.122090+02	1.00	48	6.60	75	11.80	48	6.60	75	11.70	0.002
676	0.105230+01	0.843970+00	42.00	46	46.10	72	30.20	46	42.80	72	35.10	0.053
677	-0.449940+00	-0.297340+00	42.00	46	42.80	72	35.10	46	38.40	72	38.80	0.059
678	-0.929900+00	-0.180330+01	59.00	48	39.50	90	29.50	48	40.00	90	22.30	0.118
679	0.264160+01	0.264160+01	3.00	49	0.80	88	15.60	49	0.80	88	15.60	0.028
680	0.568960+01	0.557520+01	3.00	49	0.80	88	15.60	49	1.20	88	15.00	0.003
681	0.237250+01	0.225280+01	37.00	49	7.00	88	6.60	49	18.50	88	6.60	0.154
682	-0.197710+00	-0.369480+00	37.00	49	18.50	88	6.60	49	22.20	88	7.70	0.061
683	0.313040+00	0.471590+00	37.00	49	40.20	87	29.00	49	41.10	87	30.40	0.175
684	0.219130+01	0.236620+01	37.00	49	41.10	87	30.40	49	41.20	87	32.20	0.186
685	0.261260+01	0.218150+01	14.00	50	10.70	86	42.80	50	10.00	86	40.40	0.018
686	0.200120+01	-0.161590+00	49.50	48	24.10	80	18.70	48	32.00	80	28.40	0.040
687	0.213050+01	0.139840+01	49.50	48	14.10	80	15.00	48	17.50	80	14.00	0.119
688	0.347660+01	0.283190+01	32.00	49	45.00	81	31.90	49	47.20	81	32.50	0.077
689	-0.371480+01	-0.387780+01	32.00	49	47.20	81	32.50	49	47.80	81	33.50	0.189
690	-0.184780+01	-0.203320+01	32.00	49	47.80	81	33.50	49	48.50	81	34.00	0.152
691	-0.108860+01	-0.107870+01	7.00	49	3.70	81	1.50	49	3.70	81	1.10	0.030
692	0.258150+01	0.258460+01	49.00	48	28.50	80	21.80	48	28.50	80	21.70	5.883
693	0.246300-01	0.125180+01	49.50	48	33.50	80	32.40	48	29.50	80	23.90	0.058
694	0.457200+01	0.452090+01	1.00	48	5.30	82	6.20	48	5.20	82	3.40	0.000
695	-0.195940+01	-0.203470+01	7.00	48	5.90	80	3.60	48	6.20	80	4.30	0.015
696	-0.740230+01	-0.750010+01	7.00	48	6.20	80	4.30	48	6.50	80	6.20	0.006
697	-0.338330+01	-0.296220+01	60.00	45	32.50	77	27.50	45	30.80	77	33.80	0.130
698	0.586150+00	0.661970+00	13.00	46	19.00	79	28.00	46	18.50	79	27.90	0.056
699	0.410310+01	0.414540+01	13.00	46	19.00	79	28.00	46	18.50	79	27.30	0.041
700	0.293080+01	0.254370+01	13.00	46	16.10	79	11.60	46	16.30	79	4.70	0.006
701	0.944880+01	0.965320+01	13.00	46	16.10	79	0.0	46	16.30	79	4.70	0.009
702	-0.586150+00	-0.535560+00	13.00	46	16.90	78	53.30	46	17.10	78	55.00	0.024
703	-0.351690+00	-0.689790+00	13.00	46	16.90	78	53.30	46	17.50	78	47.90	0.008
704	0.422030+00	0.299750+00	13.00	46	18.50	78	42.70	46	19.20	78	42.20	0.037
705	0.277090+01	0.293010+01	22.00	45	3.00	75	41.30	45	1.50	75	43.90	0.035
706	0.856210+01	0.890800+01	22.00	45	1.50	75	43.90	45	0.30	75	41.20	0.037
707	-0.187040+01	-0.187520+01	22.00	45	0.30	75	41.20	44	58.90	75	47.10	0.019
708	0.256310+01	0.257730+01	22.00	44	58.90	75	47.10	44	58.80	75	47.20	0.672
709	0.943430+00	0.889430+00	21.00	45	15.40	75	21.40	45	15.90	75	20.70	0.107
710	-0.529770+01	-0.516660+01	21.00	45	15.90	75	20.70	45	15.90	75	18.60	0.051
711	0.228600+01	0.221760+01	16.00	45	14.30	75	2.60	45	14.00	75	4.30	0.036
712	-0.111440+02	-0.112010+02	16.00	45	7.50	75	8.00	45	6.90	75	10.40	0.025
713	0.447680+01	0.458890+01	16.00	45	20.00	74	53.40	45	18.80	74	55.00	0.027
714	-0.998810+01	-0.998420+01	52.00	45	26.10	76	21.30	45	26.10	76	21.10	3.317

715	-0.939020+01	-0.959080+01	52.00	45	26.10	76	21.10	45	26.60	76	27.50	0.103
716	-0.460720+01	-0.469070+01	52.00	45	26.60	76	27.50	45	26.70	76	32.30	0.138
717	-0.267090+01	-0.266410+01	59.00	44	43.00	76	53.50	44	43.00	76	55.80	0.371
718	0.459780+00	0.573380+00	59.00	44	43.00	76	55.80	44	42.50	76	59.00	0.260
719	-0.190110+01	-0.232720+01	59.00	44	46.30	76	41.50	44	48.50	76	41.50	0.267
720	-0.692260+00	-0.553080+00	59.00	44	52.30	76	22.80	44	51.30	76	25.80	0.256
721	0.129670+01	0.145310+01	59.00	44	54.00	76	14.80	44	52.30	76	22.80	0.102
722	-0.109730+02	-0.115320+02	3.00	49	5.80	90	42.50	49	7.10	90	43.20	0.001
723	0.508000+01	0.466390+01	3.00	48	58.90	90	21.60	49	0.70	90	25.40	0.000
724	-0.684410+01	-0.686990+01	44.00	44	10.60	81	38.60	44	10.60	81	38.30	0.988
725	0.372790+01	0.359420+01	13.00	43	7.10	81	59.10	43	9.30	81	59.10	0.013
726	0.140620+01	0.137840+01	44.00	44	44.50	81	8.30	44	44.60	81	8.20	1.681
727	-0.137160+01	-0.173580+01	44.00	44	44.50	81	8.20	44	49.00	81	12.70	0.038
728	0.193960+00	0.132970+00	44.00	44	36.50	80	35.90	44	36.50	80	35.20	0.424
729	-0.731520+00	-0.104470+01	10.00	44	43.70	79	43.30	44	44.30	79	40.70	0.009
730	-0.716280+01	-0.740640+01	8.00	42	52.50	79	5.60	42	53.00	79	3.20	0.006
731	0.190500+00	0.121150+00	8.00	42	53.10	79	2.50	42	53.10	79	0.70	0.009
732	0.863600+01	0.854600+01	3.00	48	49.30	89	55.10	48	50.00	89	56.10	0.002
733	-0.173920+01	-0.149940+01	34.00	48	25.60	89	13.20	48	24.60	89	13.50	0.191
734	0.321430+01	0.102160+01	11.00	46	20.80	83	55.10	46	31.00	84	5.80	0.002
735	0.131060+02	0.133570+02	10.00	46	31.20	84	28.00	46	31.60	84	32.50	0.005
736	0.207820+02	0.194280+02	11.00	46	20.20	84	0.80	46	25.60	84	4.10	0.003
737	-0.993910+00	-0.122240+01	46.00	45	6.10	75	13.70	45	4.90	75	20.70	0.072
738	0.252650+01	0.251950+01	41.50	46	10.90	77	38.50	46	11.40	77	41.00	0.101
739	-0.190500+01	-0.188350+01	4.00	43	17.80	79	4.30	43	17.80	79	4.80	0.008
740	0.102780+01	0.495670+00	43.00	43	44.50	81	42.50	43	52.30	81	49.20	0.034
741	0.457200+00	0.529600+00	2.00	43	55.30	80	53.40	43	54.90	80	53.40	0.002
742	-0.228310+02	-0.235520+02	31.00	44	25.50	79	7.60	44	29.20	79	9.00	0.026
743	0.191910+01	0.436950+00	54.00	44	14.90	78	44.70	44	21.10	78	43.50	0.079
744	0.196430+02	0.199420+02	9.00	46	28.70	80	53.40	46	29.30	80	59.60	0.003
745	0.119040+02	0.119020+02	37.00	47	23.80	79	41.40	47	23.80	79	41.30	3.355
746	-0.187570+01	-0.245500+01	13.00	45	32.30	75	48.50	45	34.70	75	52.10	0.008
747	0.144780+02	0.144960+02	4.00	45	15.90	75	16.50	45	16.40	75	16.70	0.002
748	-0.700310+01	-0.700020+01	42.00	44	13.50	76	29.00	44	13.50	76	29.30	1.441
749	0.468920+01	0.474240+01	26.00	48	22.90	89	14.70	48	22.70	89	14.80	0.539
750	-0.350980+01	-0.351920+01	49.50	48	28.50	80	21.50	48	28.50	80	21.80	2.001
751	0.363420+01	0.402700+01	13.00	46	17.10	78	55.00	46	16.10	79	0.0	0.008
752	-0.147320+02	-0.147620+02	3.00	42	51.30	80	29.50	42	51.30	80	31.50	0.001
753	-0.457200+01	-0.441860+01	8.00	46	27.40	80	23.70	46	27.60	80	26.70	0.005
754	0.107580+01	0.792760+00	17.00	46	5.10	80	39.00	46	7.10	80	40.40	0.022
755	0.448240+01	0.443120+01	34.00	46	33.90	81	8.40	46	35.20	81	11.90	0.071
756	-0.806820+01	-0.790420+01	34.00	46	34.50	81	16.80	46	36.10	81	24.50	0.035
757	0.101600+01	0.891690+00	24.00	46	36.10	81	24.50	46	37.20	81	26.40	0.057
758	0.762000+01	0.682900+01	24.00	46	37.20	81	26.40	46	42.50	81	33.20	0.014
759	-0.158180+01	-0.232890+01	58.00	48	1.00	84	31.30	48	4.00	84	33.00	0.176
760	-0.480060+01	-0.436510+01	12.00	42	6.30	83	6.60	42	8.10	83	6.90	0.013
761	-0.920150+00	-0.751450+00	53.00	48	57.30	87	57.50	48	59.60	88	1.50	0.132
762	-0.398560+01	-0.416850+01	13.00	43	39.00	81	42.40	43	40.50	81	42.40	0.019
763	0.703380-01	-0.241580+00	13.00	43	36.40	81	42.40	43	39.00	81	42.40	0.011
764	-0.491610-02	0.166070+00	62.00	44	25.80	80	50.60	44	23.40	80	47.40	0.190
765	-0.937260+01	-0.942450+01	4.00	45	20.40	80	0.0	45	20.90	80	0.50	0.004
766	0.185930+01	0.194120+01	50.00	48	28.80	81	19.50	48	28.50	81	19.50	1.405
767	-0.132520+01	-0.131060+01	11.50	46	30.50	84	19.70	46	30.40	84	19.50	0.131
768	-0.381000+01	-0.421610+01	54.00	46	31.30	84	20.60	46	32.90	84	21.80	0.273
769	0.129540+02	0.129260+02	8.00	47	27.10	79	37.90	47	27.30	79	38.40	0.027
770	-0.364070+01	-0.441580+01	36.00	47	15.50	79	45.00	47	20.30	79	48.00	0.042
771	0.804330+00	0.845230-01	36.00	47	20.30	79	48.00	47	23.80	79	41.40	0.038
772	0.121920+02	0.119360+02	2.00	43	36.30	79	44.80	43	37.00	79	43.00	0.000
773	0.143690+01	0.142710+01	42.00	43	54.60	80	52.50	43	54.80	80	52.90	0.374
774	-0.402340+01	-0.403650+01	5.00	42	59.10	82	20.70	42	59.20	82	22.50	0.003
775	-0.227380+02	-0.227490+02	5.00	42	59.00	82	19.40	42	59.10	82	20.70	0.005

776	0.213335+01	0.212290+01	5.00	42	59.00	82	17.40	42	59.00	82	18.70	0.005
777	-0.609600+00	-0.905030+00	3.00	49	7.90	90	45.40	49	8.60	90	48.20	0.001
778	0.228010+01	0.218790+01	52.00	44	45.00	79	53.20	44	44.80	79	51.50	0.384
779	0.397570+01	0.407290+01	11.50	46	30.50	84	19.70	46	30.70	84	21.60	0.017
780	-0.430880+01	-0.454720+01	44.00	43	55.80	81	42.10	43	57.60	81	42.20	0.113
781	0.325390+01	0.282080+01	37.00	46	18.50	79	27.30	46	20.90	79	26.50	0.094
782	-0.864970+00	-0.800270+00	37.00	46	19.50	79	28.30	46	19.00	79	29.00	0.427
783	-0.281940+02	-0.282260+02	4.00	43	17.80	79	48.00	43	17.90	79	47.80	0.016
784	0.255370+01	0.221890+01	37.00	46	56.00	79	43.80	46	58.10	79	44.40	0.108
785	-0.213360+01	-0.174960+01	12.00	42	3.70	83	6.80	42	5.10	83	6.80	0.017
786	-0.165250+01	-0.149790+01	41.50	46	11.50	77	41.00	46	10.40	77	41.30	0.162
787	0.251160+02	0.251050+02	5.00	42	58.90	82	16.30	42	59.00	82	17.40	0.006
788	0.682750+01	0.682190+01	5.00	42	59.00	82	18.70	42	59.00	82	19.40	0.009
789	-0.268830+02	-0.268890+02	5.00	42	59.20	82	22.50	42	59.30	82	23.30	0.008
790	0.121920+02	0.122820+02	8.50	44	5.50	81	18.80	44	4.80	81	18.50	0.017
791	0.914400+01	0.885260+01	2.00	43	37.00	79	43.00	43	37.80	79	41.00	0.000
792	-0.304800+01	-0.298200+01	3.00	43	25.80	80	31.20	43	25.50	80	31.30	0.005
793	-0.175420+01	-0.227580+01	49.00	49	43.70	83	52.90	49	43.00	83	48.30	0.125
794	0.629000+01	0.545250+01	11.00	46	29.50	84	4.10	46	32.50	84	9.90	0.004
795	0.831270+00	0.821010+00	11.00	46	32.50	84	8.90	46	32.80	84	9.90	0.027
796	-0.775850+00	0.225610+00	11.00	46	32.80	84	9.90	46	31.40	84	16.60	0.004
797	0.592970+01	0.633360+01	11.00	46	31.20	84	17.50	46	30.40	84	19.30	0.014
798	0.446210+01	0.251170+01	61.00	42	18.30	82	32.70	42	18.50	82	50.70	0.051
799	0.143440+01	0.152870+01	17.00	48	43.30	94	33.70	48	43.20	94	35.20	0.047
800	-0.163160+02	-0.160940+02	17.00	48	43.50	94	32.00	48	43.30	94	33.70	0.041
801	0.141610+02	0.104410+02	37.00	49	22.40	88	8.20	49	41.10	87	32.20	0.007
802	0.163480+01	0.177360+01	11.00	46	31.40	84	16.60	46	31.20	84	17.50	0.031
803	-0.207610+01	-0.130800+01	53.00	48	59.30	88	15.70	48	56.00	88	18.70	0.122
804	0.812800+00	-0.296640+01	3.00	49	52.80	93	21.10	49	54.10	93	21.60	0.001
805	0.416560+01	0.210740+01	3.00	49	47.80	92	51.00	49	48.60	92	51.80	0.002
806	-0.436880+01	-0.469220+01	3.00	49	24.90	91	39.80	49	25.10	91	40.80	0.002
807	-0.203200+00	-0.115210+01	3.00	49	17.30	91	18.30	49	18.30	91	22.10	0.001
808	0.812800+00	0.485120+00	3.00	49	14.50	91	2.40	49	14.50	91	1.80	0.000
809	0.101600+00	0.101600+00	3.00	47	46.30	83	22.50	47	46.30	83	22.50	0.028
810	-0.292610+02	-0.294000+02	1.00	43	28.30	80	30.80	43	29.10	80	31.50	0.000
811	0.0	0.684880-01	4.00	43	28.00	80	27.30	43	27.80	80	28.00	0.005
812	-0.159510+02	-0.159100+02	3.00	43	49.80	30	31.30	43	49.80	80	32.00	0.003
813	-0.207260+02	-0.208710+02	1.00	44	0.80	79	40.80	44	1.30	79	40.30	0.000
814	-0.959030+01	-0.115550+02	28.00	44	25.30	78	16.40	44	33.50	78	12.50	0.010
815	-0.299470+02	-0.299910+02	8.00	44	22.80	77	53.80	44	23.00	77	53.80	0.054
816	-0.510540+01	-0.523660+01	12.00	42	2.20	82	44.50	42	2.20	82	45.30	0.044
817	-0.182880+02	-0.182850+02	8.00	42	52.40	79	15.10	42	52.40	79	15.20	0.157
818	-0.609600+01	-0.665820+01	10.00	48	32.30	89	41.20	48	32.40	89	36.60	0.005
819	0.299050+01	0.313420+01	53.00	49	0.20	88	12.50	49	1.20	88	15.00	0.238
820	-0.920150+00	-0.751450+00	53.00	48	57.30	87	57.50	48	59.60	88	1.50	0.132
821	0.189210+01	0.214880+01	53.00	48	54.30	87	43.10	48	55.30	87	46.40	0.191
822	0.366780+01	0.184480+01	60.00	48	44.30	91	58.50	48	45.00	91	35.00	0.038
823	-0.195680+02	-0.195970+02	5.00	49	24.90	91	39.80	49	24.90	91	40.00	0.031
824	0.286510+02	0.289200+02	1.00	46	31.40	84	15.80	46	31.00	84	17.50	0.000
825	-0.746450-01	-0.207210+00	49.00	46	26.20	80	16.50	46	25.20	80	13.20	0.176
826	-0.527300+02	-0.526020+02	3.00	48	56.40	90	9.90	48	57.20	90	15.20	0.000
827	-0.259180+02	-0.280180+02	3.00	49	50.90	93	21.80	49	51.80	93	21.50	0.002
828	0.254000+01	0.222020+01	3.00	47	45.30	83	22.80	47	46.30	83	22.50	0.001
829	-0.276350+02	-0.280030+02	3.00	49	15.40	91	13.30	49	15.80	91	15.50	0.001
830	0.237740+01	-0.177560+01	60.00	48	38.30	93	21.50	48	42.50	93	1.50	0.042
831	0.620070+01	0.312080+01	49.50	48	32.00	80	27.90	48	42.00	80	47.20	0.025
832	0.101600+00	-0.779380-01	3.00	47	44.80	83	23.30	47	45.30	83	22.80	0.003
833	-0.152400+01	-0.146720+01	13.00	42	34.00	82	22.80	42	35.10	82	22.80	0.026
834	0.173740+02	0.255290+01	100.00	43	38.40	79	22.80	44	13.10	76	31.10	0.137
835	0.115820+02	-0.152270+01	100.00	43	38.40	79	22.80	44	0.0	76	13.00	0.139
836	-0.579120+01	-0.407560+01	100.00	44	17.10	76	31.10	44	0.0	76	13.00	0.296

837	-0.94488D+01	-0.19684D+01	100.00	43	25.00	76	35.00	43	38.40	79	22.80	0.138
838	0.79248D+01	0.58456D+00	100.00	43	25.00	76	35.00	44	13.10	76	31.10	0.279
839	0.21336D+01	-0.34911D+01	100.00	43	25.00	76	35.00	44	0.0	76	13.00	0.311
840	-0.60960D+01	-0.74580D+01	100.00	42	39.50	81	12.80	42	52.40	79	15.20	0.052
841	0.30480D+00	-0.27290D+01	100.00	42	39.50	81	12.80	42	55.00	78	52.00	0.052
842	-0.54864D+01	-0.39205D+01	100.00	42	39.50	81	12.80	41	30.00	81	38.00	0.047
843	-0.64008D+01	-0.47290D+01	100.00	42	55.00	78	52.00	42	52.40	79	15.20	0.131
844	-0.57912D+01	-0.11915D+01	100.00	42	55.00	78	52.00	41	30.00	81	38.00	0.079
845	-0.60960D+00	-0.35375D+01	100.00	41	30.00	81	38.00	42	52.40	79	15.20	0.080
846	-0.20726D+02	-0.28507D+01	100.00	46	15.20	83	33.10	43	44.80	81	43.70	0.075
847	0.0	0.31965D+01	100.00	46	15.20	83	33.10	44	30.30	80	13.00	0.133
848	-0.19202D+02	0.21198D+01	100.00	46	15.20	83	33.10	43	55.00	82	45.00	0.073
849	-0.11582D+02	0.34394D+01	100.00	46	15.20	83	33.10	45	47.00	84	47.00	0.076
850	0.20422D+02	0.57424D+01	100.00	43	44.80	81	43.70	44	30.30	80	13.00	0.049
851	0.15240D+01	0.49705D+01	100.00	43	44.80	81	43.70	43	55.00	82	45.00	0.077
852	0.94488D+01	0.65949D+01	100.00	43	44.80	81	43.70	45	47.00	84	47.00	0.047
853	-0.19202D+02	-0.10767D+01	100.00	44	30.30	80	13.00	43	55.00	82	45.00	0.301
854	-0.11278D+02	0.54772D+00	100.00	44	30.30	80	13.00	45	47.00	84	47.00	0.075
855	-0.76200D+01	-0.13196D+01	100.00	45	47.00	84	47.00	43	55.00	82	45.00	0.074
856	0.57912D+01	-0.54101D+00	100.00	46	29.00	84	40.00	46	24.60	89	13.00	0.073
857	0.28956D+02	0.15517D+01	100.00	46	29.00	84	40.00	47	57.70	84	54.00	0.131
858	-0.12192D+02	0.28571D-01	100.00	46	29.00	84	40.00	46	32.00	87	27.00	0.289
859	-0.23470D+02	0.34723D+00	100.00	46	29.00	84	40.00	46	45.00	92	6.00	0.074
860	-0.23192D+02	-0.20927D+01	100.00	47	57.70	84	54.00	48	24.60	89	13.00	0.046
861	-0.40843D+02	-0.12184D+01	100.00	47	57.70	84	54.00	46	32.00	87	27.00	0.128
862	-0.52121D+02	-0.89971D+00	100.00	47	57.70	84	54.00	46	45.00	92	6.00	0.046
863	-0.17678D+02	0.87438D+00	100.00	48	24.60	89	13.00	46	32.00	87	27.00	0.074
864	-0.28956D+02	0.11930D+01	100.00	48	24.60	89	13.00	46	45.00	92	6.00	0.072
865	0.11278D+02	-0.31866D+00	100.00	46	45.00	92	6.00	46	32.00	87	27.00	0.133
866	0.23652D+02	0.32959D+02	100.00	42	1.60	82	44.10	42	52.40	79	15.20	0.001
867	0.79248D+00	-0.53469D+01	100.00	43	14.20	79	13.20	43	38.40	79	22.80	0.017
868	0.21549D+02	0.58934D+00	100.00	43	14.20	79	13.20	44	13.10	76	31.10	0.009
869	0.30480D+00	-0.69954D+01	100.00	46	15.20	83	33.10	45	20.30	80	2.20	0.005
870	-0.20726D+01	0.84241D+01	100.00	45	20.30	80	2.20	44	30.30	80	13.00	0.005
871	-0.79553D+01	0.17221D+02	100.00	45	20.30	80	2.20	43	44.80	81	43.70	0.001
872	0.13106D+02	0.23775D+02	100.00	42	1.60	82	44.10	42	39.50	81	12.80	0.001

(iii) 4-th Order Surface

OBSER. NUMBER	OBSER. VECTOR	RESIDUAL	TIME SPAN	PHI A	LAMDA A	PHI B	LAMDA B	WEIGHT
1	0.63835D+00	0.82344D+00	53.00	48 47.30	87 11.00	48 47.40	87 14.20	0.215
2	-0.11502D+01	-0.98754D+00	53.00	48 39.60	86 16.10	48 39.30	86 17.10	0.631
3	0.10208D+02	0.13885D+02	53.00	48 52.90	88 23.60	48 46.80	88 33.10	0.053
4	-0.86839D+01	-0.79588D+01	53.00	49 1.20	88 15.00	48 59.30	88 15.70	0.242
5	0.29905D+01	0.27557D+01	53.00	49 0.20	88 12.50	49 1.20	88 15.00	0.238
6	0.30480D+01	0.36737D+01	3.00	49 51.80	93 21.50	49 52.80	93 21.10	0.001
7	0.11786D+02	0.12115D+02	3.00	49 54.10	93 21.60	49 54.90	93 21.50	0.002
8	0.51816D+01	0.58335D+01	3.00	49 54.90	93 21.50	49 55.40	93 21.10	0.003
9	0.52832D+01	0.52751D+01	3.00	49 55.40	93 21.10	49 56.50	93 21.40	0.001
10	0.50800D+00	0.81614D+00	3.00	49 56.50	93 21.40	49 57.60	93 21.50	0.001
11	-0.31496D+01	-0.32816D+01	3.00	49 57.60	93 21.50	49 57.90	93 21.70	0.005
12	0.13919D+02	0.12761D+02	3.00	49 50.50	93 20.80	49 50.90	93 21.80	0.002
13	0.13716D+02	0.12229D+02	3.00	49 50.10	93 19.50	49 50.50	93 20.80	0.002
14	0.89408D+01	0.74872D+01	3.00	49 49.60	93 18.20	49 50.10	93 19.50	0.001
15	0.11176D+02	0.93184D+01	3.00	49 48.90	93 16.50	49 49.60	93 18.20	0.001
16	-0.29464D+01	-0.43428D+01	3.00	49 48.50	93 15.20	49 48.90	93 16.50	0.002
17	0.81280D+00	0.28484D+00	3.00	49 48.30	93 14.70	49 48.50	93 15.20	0.004
18	0.54864D+01	0.38786D+01	3.00	49 48.50	93 13.20	49 48.30	93 14.70	0.001
19	0.13411D+02	0.11214D+02	3.00	49 48.50	93 11.10	49 48.50	93 13.20	0.001
20	0.19202D+02	0.18377D+02	3.00	49 48.50	93 10.30	49 48.50	93 11.10	0.003
21	-0.92456D+01	-0.10674D+02	3.00	49 48.50	93 8.90	49 48.50	93 10.30	0.002
22	0.67056D+01	0.58983D+01	3.00	49 48.50	93 8.10	49 48.50	93 8.90	0.003
23	0.79248D+01	0.60149D+01	3.00	49 48.60	93 6.20	49 48.50	93 8.10	0.001
24	0.11379D+02	0.10104D+02	3.00	49 48.60	93 4.90	49 48.60	93 6.20	0.002
25	0.25400D+01	0.32486D+00	3.00	49 48.60	93 2.60	49 48.60	93 4.90	0.001
26	-0.17272D+01	-0.30502D+01	3.00	49 48.60	93 1.20	49 48.60	93 2.60	0.002
27	-0.80264D+01	-0.10820D+02	3.00	49 48.60	92 55.80	49 48.60	92 58.90	0.001
28	-0.17272D+01	-0.28333D+01	3.00	49 48.60	92 58.90	49 48.60	93 0.10	0.002
29	-0.14224D+02	-0.14224D+02	3.00	49 48.60	92 58.90	49 48.60	92 59.90	0.028
30	-0.10465D+02	-0.11784D+02	3.00	49 48.60	92 54.30	49 48.60	92 55.80	0.001
31	0.13208D+01	-0.23510D+00	3.00	49 48.60	92 52.50	49 48.60	92 54.30	0.001
32	0.81280D+00	0.21577D+00	3.00	49 48.60	92 51.80	49 48.60	92 52.50	0.003
33	-0.27432D+01	-0.27561D+01	3.00	49 46.80	92 50.60	49 47.80	92 51.00	0.001
34	-0.13513D+02	-0.14377D+02	3.00	49 46.70	92 49.50	49 46.80	92 50.60	0.002
35	0.37592D+01	0.31335D+01	3.00	49 46.90	92 48.80	49 46.70	92 49.50	0.003
36	-0.72136D+01	-0.82176D+01	3.00	49 46.80	92 47.50	49 46.90	92 48.90	0.002
37	-0.12192D+02	-0.13637D+02	3.00	49 46.90	92 45.70	49 46.50	92 47.50	0.001
38	-0.18593D+02	-0.19825D+02	3.00	49 46.90	92 44.10	49 46.90	92 45.70	0.001

39	0.97536D+01	0.88439D+01	3.00	49 46.90	92 42.90	49 46.90	92 44.10	0.002
40	0.31496D+01	0.25904D+01	3.00	49 46.60	92 42.00	49 46.90	92 42.90	0.002
41	-0.59944D+01	-0.64065D+01	3.00	49 45.70	92 41.00	49 46.60	92 42.00	0.001
42	0.15240D+01	0.79573D+00	3.00	49 45.30	92 39.80	49 45.70	92 41.00	0.002
43	0.12192D+01	0.64335D+00	3.00	49 44.90	92 38.80	49 45.30	92 39.80	0.002
44	-0.45720D+01	-0.50412D+01	3.00	49 44.40	92 37.90	49 44.90	92 38.80	0.002
45	-0.30480D+00	-0.74369D+00	3.00	49 43.80	92 37.00	49 44.40	92 37.90	0.002
46	-0.33528D+01	-0.35278D+01	3.00	49 43.20	92 36.50	49 43.80	92 37.00	0.002
47	-0.75184D+01	-0.77751D+01	3.00	49 42.90	92 36.00	49 43.20	92 36.50	0.003
48	0.54864D+01	0.49737D+01	3.00	49 42.00	92 34.90	49 42.90	92 36.00	0.001
49	0.28448D+01	0.23517D+01	3.00	49 41.60	92 34.00	49 42.00	92 34.90	0.002
50	-0.97536D+01	-0.10218D+02	3.00	49 41.40	92 33.20	49 41.50	92 34.00	0.003
51	-0.56896D+01	-0.64151D+01	3.00	49 41.30	92 32.00	49 41.40	92 33.20	0.002
52	-0.39624D+01	-0.44937D+01	3.00	49 41.20	92 31.10	49 41.30	92 32.00	0.002
53	-0.35560D+01	-0.42654D+01	3.00	49 41.40	92 30.00	49 41.20	92 31.10	0.002
54	0.14224D+02	0.14226D+02	3.00	49 40.50	92 29.70	49 41.40	92 30.00	0.002
55	0.11278D+02	0.11303D+02	3.00	49 40.00	92 29.60	49 40.50	92 29.70	0.003
56	0.32512D+01	0.28983D+01	3.00	49 39.20	92 28.80	49 40.00	92 29.60	0.002
57	-0.80264D+01	-0.84482D+01	3.00	49 38.90	92 28.00	49 39.20	92 28.80	0.002
58	0.17272D+01	0.11522D+01	3.00	49 38.50	92 26.90	49 38.90	92 28.00	0.002
59	-0.21946D+02	-0.21826D+02	3.00	49 36.70	92 26.90	49 38.50	92 26.90	0.001
60	0.27432D+01	0.21591D+01	3.00	49 36.20	92 25.80	49 36.70	92 26.90	0.002
61	-0.74168D+01	-0.80499D+01	3.00	49 35.50	92 24.60	49 36.20	92 25.80	0.001
62	0.30480D+00	-0.82837D+00	3.00	49 35.10	92 22.40	49 35.50	92 24.60	0.001
63	0.22657D+02	0.21560D+02	3.00	49 34.90	92 20.20	49 35.10	92 22.40	0.001
64	0.16967D+02	0.16480D+02	3.00	49 34.90	92 19.20	49 34.90	92 20.20	0.002
65	0.45720D+01	0.40902D+01	3.00	49 34.90	92 18.20	49 34.90	92 19.20	0.002
66	-0.53844D+01	-0.63637D+01	3.00	49 35.00	92 16.10	49 34.90	92 18.20	0.001
67	-0.50800D+01	-0.52572D+01	3.00	49 34.50	92 15.70	49 35.00	92 16.10	0.003
68	0.26111D+02	0.25562D+02	3.00	49 33.90	92 14.50	49 34.50	92 15.70	0.001
69	0.19609D+02	0.19209D+02	3.00	49 33.10	92 12.00	49 33.40	92 12.90	0.002
70	0.35560D+01	0.29819D+01	3.00	49 32.60	92 10.70	49 33.10	92 12.00	0.001
71	-0.85344D+01	-0.90141D+01	3.00	49 32.20	92 9.60	49 32.60	92 10.70	0.002
72	0.11481D+02	0.10900D+02	3.00	49 32.10	92 8.20	49 32.20	92 9.60	0.002
73	0.28448D+01	0.24537D+01	3.00	49 32.50	92 7.20	49 32.10	92 8.20	0.002
74	0.50800D+01	0.47226D+01	3.00	49 31.60	92 6.40	49 32.50	92 7.20	0.001
75	-0.28448D+01	-0.34165D+01	3.00	49 31.20	92 5.00	49 31.60	92 6.40	0.001
76	-0.58928D+01	-0.63959D+01	3.00	49 30.60	92 3.80	49 31.20	92 5.00	0.001
77	-0.61976D+01	-0.66637D+01	3.00	49 30.00	92 2.70	49 30.60	92 3.80	0.002
78	-0.14732D+02	-0.15082D+02	3.00	49 29.80	92 1.80	49 30.00	92 2.70	0.002
79	-0.23368D+01	-0.30358D+01	3.00	49 29.30	92 0.0	49 29.80	92 1.80	0.001
80	-0.15240D+01	-0.18273D+01	3.00	49 29.10	91 59.20	49 29.30	92 0.0	0.003
81	-0.14732D+02	-0.15259D+02	3.00	49 29.00	91 57.70	49 29.10	91 59.20	0.001
82	-0.83312D+01	-0.88560D+01	3.00	49 28.30	91 56.40	49 29.00	91 57.70	0.001
83	-0.34544D+01	-0.44933D+01	3.00	49 27.80	91 53.40	49 28.30	91 56.40	0.001
84	0.75184D+01	0.71622D+01	3.00	49 27.50	91 52.40	49 27.80	91 53.40	0.002
85	0.84328D+01	0.80651D+01	3.00	49 27.30	91 51.30	49 27.50	91 52.40	0.002
86	-0.11786D+02	-0.12163D+02	3.00	49 27.20	91 50.10	49 27.30	91 51.30	0.002
87	-0.50800D+00	-0.87916D+00	3.00	49 27.30	91 48.80	49 27.20	91 50.10	0.002
88	0.11176D+01	0.26960D+00	3.00	49 27.00	91 46.00	49 27.30	91 48.80	0.001
89	0.81280D+00	0.43001D+00	3.00	49 26.30	91 45.00	49 27.00	91 46.00	0.002
90	-0.17272D+01	-0.20386D+01	3.00	49 25.90	91 44.10	49 26.30	91 45.00	0.002
91	0.81280D+01	0.78661D+01	3.00	49 26.10	91 43.00	49 25.90	91 44.10	0.002
92	-0.21336D+01	-0.26543D+01	3.00	49 25.80	91 41.20	49 26.10	91 43.00	0.001
93	0.26416D+01	0.24167D+01	3.00	49 25.10	91 40.80	49 25.80	91 41.20	0.002
94	-0.14122D+02	-0.14477D+02	3.00	49 24.60	91 38.60	49 24.90	91 39.80	0.002
95	-0.40640D+00	-0.69659D+00	3.00	49 23.90	91 38.00	49 24.60	91 38.60	0.002
96	-0.45720D+01	-0.49693D+01	3.00	49 23.60	91 36.60	49 23.90	91 38.00	0.002
97	-0.14224D+02	-0.14571D+02	3.00	49 23.00	91 35.70	49 23.60	91 36.60	0.002
98	-0.13208D+01	-0.24647D+01	3.00	49 21.40	91 32.40	49 23.00	91 35.70	0.001
99	-0.13515D+02	-0.13887D+02	3.00	49 20.90	91 31.30	49 21.40	91 32.40	0.002

100	0.14224D+01	0.10889D+01	3.00	49	20.60	91	30.10	49	20.90	91	31.30	0.002
101	-0.50800D+01	-0.54486D+01	3.00	49	20.30	91	28.70	49	20.60	91	30.10	0.002
102	-0.25806D+02	-0.26465D+02	3.00	49	19.60	91	26.40	49	20.30	91	28.70	0.001
103	-0.32512D+01	-0.36232D+01	3.00	49	19.30	91	24.90	49	19.60	91	26.40	0.001
104	0.10160D+02	0.98496D+01	3.00	49	18.90	91	23.90	49	19.30	91	24.90	0.002
105	-0.18286D+01	-0.23444D+01	3.00	49	18.30	91	22.10	49	18.90	91	23.90	0.001
106	-0.50800D+01	-0.54038D+01	3.00	49	16.80	91	17.40	49	17.30	91	18.30	0.002
107	-0.69088D+01	-0.73035D+01	3.00	49	16.20	91	16.30	49	16.80	91	17.40	0.002
108	-0.11074D+02	-0.11349D+02	3.00	49	15.80	91	15.50	49	16.20	91	16.30	0.002
109	-0.66040D+01	-0.68611D+01	3.00	49	15.20	91	12.00	49	15.40	91	13.30	0.002
110	-0.13208D+02	-0.13418D+02	3.00	49	15.30	91	10.10	49	15.20	91	12.00	0.001
111	-0.67056D+01	-0.67298D+01	3.00	49	15.60	91	9.00	49	15.30	91	10.10	0.002
112	-0.89408D+01	-0.95283D+01	3.00	49	14.80	91	6.80	49	15.60	91	9.00	0.001
113	0.14224D+02	0.13911D+02	3.00	49	14.20	91	0.60	49	14.50	91	2.40	0.001
114	-0.69088D+01	-0.73086D+01	3.00	49	11.60	90	52.40	49	12.40	90	53.00	0.002
115	0.26416D+01	0.22976D+01	3.00	49	11.00	90	51.50	49	11.60	90	52.40	0.002
116	-0.12192D+02	-0.12548D+02	3.00	49	10.40	90	50.50	49	11.00	90	51.50	0.002
117	-0.68072D+01	-0.71504D+01	3.00	49	9.70	90	50.40	49	10.40	90	50.50	0.002
118	-0.12192D+02	-0.12518D+02	3.00	49	9.10	90	50.00	49	9.70	90	50.40	0.002
119	-0.37592D+01	-0.39731D+01	3.00	49	8.80	90	49.10	49	9.10	90	50.00	0.002
120	-0.14732D+02	-0.14894D+02	3.00	49	8.60	90	48.20	49	8.80	90	49.10	0.002
121	-0.12192D+01	-0.13760D+01	3.00	49	7.70	90	44.50	49	7.90	90	45.40	0.002
122	0.91440D+00	0.52675D+00	3.00	49	7.10	90	43.20	49	7.70	90	44.50	0.001
123	-0.73152D+01	-0.76716D+01	3.00	49	5.20	90	42.10	49	5.80	90	42.50	0.002
124	0.20422D+02	0.19737D+02	3.00	49	4.10	90	41.00	49	5.20	90	42.10	0.001
125	0.80264D+01	0.75900D+01	3.00	49	3.40	90	40.50	49	4.10	90	41.00	0.002
126	0.11379D+02	0.11035D+02	3.00	49	2.90	90	39.40	49	3.40	90	40.50	0.002
127	0.17272D+01	0.15047D+01	3.00	49	2.60	90	38.30	49	2.60	90	39.40	0.002
128	-0.15342D+02	-0.15393D+02	3.00	49	2.60	90	36.80	49	2.60	90	38.30	0.001
129	-0.99568D+01	-0.98819D+01	3.00	49	2.80	90	35.40	49	2.60	90	36.80	0.002
130	-0.20726D+02	-0.20761D+02	3.00	49	2.70	90	34.30	49	2.80	90	35.40	0.002
131	0.89408D+01	0.88828D+01	3.00	49	2.80	90	32.30	49	2.80	90	34.30	0.001
132	0.43688D+01	0.43313D+01	3.00	49	2.80	90	30.90	49	2.80	90	32.30	0.002
133	0.54864D+01	0.54562D+01	3.00	49	2.80	90	29.70	49	2.80	90	30.90	0.002
134	-0.52832D+01	-0.53138D+01	3.00	49	2.80	90	28.40	49	2.80	90	29.70	0.002
135	-0.22352D+01	-0.24730D+01	3.00	49	2.40	90	28.20	49	2.80	90	28.40	0.004
136	0.11989D+02	0.11808D+02	3.00	49	2.10	90	28.00	49	2.40	90	28.20	0.005
137	0.16866D+02	0.16425D+02	3.00	49	1.40	90	26.80	49	2.10	90	28.00	0.001
138	-0.83312D+01	-0.85894D+01	3.00	48	58.50	90	20.40	48	58.90	90	21.60	0.002
139	-0.16459D+02	-0.16716D+02	3.00	48	58.10	90	19.20	48	58.50	90	20.40	0.002
140	-0.61976D+01	-0.65777D+01	3.00	48	57.50	90	16.60	48	58.10	90	19.20	0.001
141	0.76200D+01	0.74339D+01	3.00	48	57.20	90	15.20	48	57.50	90	16.60	0.002
142	0.45720D+01	0.45228D+01	3.00	48	56.30	90	8.70	48	56.40	90	9.80	0.002
143	-0.11887D+02	-0.12058D+02	3.00	48	56.00	90	7.30	48	56.30	90	8.70	0.002
144	-0.84328D+01	-0.87853D+01	3.00	48	54.10	90	1.50	48	54.70	90	3.10	0.001
145	0.11684D+02	0.10697D+02	3.00	48	52.50	89	59.00	48	54.10	90	1.50	0.001
146	0.10871D+02	0.10558D+02	3.00	48	52.00	89	58.30	48	52.50	89	59.00	0.002
147	-0.12192D+02	-0.12220D+02	44.00	44	26.50	81	24.20	44	26.70	81	24.10	0.965
148	-0.17387D+01	-0.16962D+01	44.00	44	29.60	81	22.40	44	29.40	81	22.60	0.840
149	0.59319D+01	0.60201D+01	13.00	42	30.10	82	18.40	42	31.40	82	20.00	0.017
150	0.36107D+01	0.37515D+01	13.00	42	31.40	82	20.00	42	33.30	82	22.40	0.011
151	-0.29073D+01	-0.28535D+01	13.00	42	33.30	82	22.40	42	34.00	82	22.80	0.038
152	0.24853D+01	0.25245D+01	13.00	42	35.10	82	22.80	42	35.60	82	23.00	0.055
153	-0.44313D+01	-0.44236D+01	13.00	42	35.60	82	23.00	42	35.70	82	23.00	0.285
154	-0.84172D+01	-0.84172D+01	13.00	42	35.70	82	23.00	42	35.70	82	23.00	0.528
155	-0.86751D+00	-0.88505D+00	13.00	43	1.20	82	19.50	43	1.20	82	19.00	0.083
156	0.67056D+01	0.66695D+01	13.00	43	1.20	82	19.00	43	1.50	82	17.40	0.025
157	0.11020D+01	0.10342D+01	13.00	43	1.50	82	17.40	43	1.70	82	15.20	0.019
158	0.20396D+01	0.20077D+01	13.00	43	1.70	82	15.20	43	2.20	82	13.50	0.022
159	-0.37045D+01	-0.37703D+01	13.00	43	2.20	82	13.50	43	2.60	82	11.20	0.017
160	0.32356D+01	0.31588D+01	13.00	43	2.60	82	11.20	43	2.20	82	9.50	0.022

161	0.16178D+01	0.16258D+01	13.00	43	2.20	82	9.90	43	2.40	82	9.80	0.135
162	0.12895D+01	0.11646D+01	13.00	43	2.40	82	9.80	43	3.20	82	5.70	0.010
163	0.24384D+01	0.24994D+01	13.00	43	3.10	82	0.20	43	4.50	82	0.10	0.020
164	-0.50878D+01	-0.50278D+01	13.00	43	4.50	82	0.10	43	5.80	82	0.10	0.022
165	0.27901D+01	0.27947D+01	13.00	43	5.80	82	0.10	43	5.90	82	0.10	0.285
166	0.11723D+00	0.11723D+00	13.00	43	5.90	82	0.10	43	5.90	82	0.10	0.528
167	-0.14068D+00	-0.13580D+00	13.00	43	5.80	82	0.10	43	5.70	82	0.30	0.168
168	-0.67759D+01	-0.70121D+01	13.00	43	3.20	82	5.70	43	3.10	82	0.20	0.008
169	-0.70338D+00	-0.67463D+00	13.00	43	9.30	81	59.10	43	10.10	81	59.00	0.035
170	-0.21102D+01	-0.21367D+01	13.00	43	10.10	81	59.00	43	10.90	81	57.90	0.026
171	0.42203D+01	0.42243D+01	13.00	43	10.90	81	57.90	43	11.00	81	57.90	0.285
172	0.17116D+01	0.16716D+01	13.00	43	11.80	81	55.00	43	12.80	81	53.70	0.021
173	0.29542D+01	0.28970D+01	13.00	43	12.80	81	53.70	43	12.30	81	53.00	0.041
174	-0.49237D+01	-0.49663D+01	13.00	43	19.00	81	45.30	43	19.70	81	44.50	0.032
175	0.32825D+00	0.28670D+00	13.00	43	19.70	81	44.50	43	20.60	81	43.70	0.027
176	0.14302D+01	0.13027D+01	13.00	43	10.90	81	57.90	43	11.80	81	55.00	0.013
177	-0.63539D+01	-0.67241D+01	13.00	43	12.80	81	53.70	43	19.00	81	45.30	0.003
178	-0.56505D+01	-0.57149D+01	13.00	43	20.60	81	43.70	43	24.80	81	42.10	0.007
179	0.21805D+01	0.21863D+01	13.00	43	24.80	81	42.10	43	26.20	81	42.00	0.020
180	0.29073D+01	0.29042D+01	13.00	43	26.20	81	42.00	43	27.70	81	41.60	0.019
181	0.20398D+01	0.20336D+01	13.00	43	27.70	81	41.60	43	29.10	81	41.60	0.020
182	-0.23446D+01	-0.23458D+01	13.00	43	29.10	81	41.60	43	30.30	81	41.50	0.024
183	0.36576D+01	0.36550D+01	13.00	43	30.30	81	41.50	43	31.50	81	41.40	0.024
184	-0.12426D+01	-0.12384D+01	13.00	43	31.50	81	41.40	43	32.60	81	41.40	0.026
185	0.32356D+01	0.32828D+01	13.00	43	32.60	81	41.40	43	33.70	81	41.90	0.025
186	0.10316D+01	0.10316D+01	13.00	43	33.70	81	41.90	43	33.70	81	41.90	0.528
187	-0.44782D+01	-0.44594D+01	13.00	43	33.70	81	41.90	43	34.10	81	42.10	0.067
188	0.39155D+01	0.39449D+01	13.00	43	34.10	81	42.10	43	35.10	81	42.40	0.028
189	-0.13364D+01	-0.13341D+01	13.00	43	35.10	81	42.40	43	36.40	81	42.40	0.022
190	0.70338D-01	0.70202D-01	13.00	43	36.40	81	42.40	43	39.00	81	42.40	0.011
191	-0.39858D+01	-0.39890D+01	13.00	43	39.00	81	42.40	43	40.50	81	42.40	0.019
192	-0.56271D+00	-0.56533D+00	13.00	43	40.50	81	42.40	43	41.30	81	42.40	0.036
193	0.60960D+00	0.59828D+00	13.00	43	41.30	81	42.40	43	43.60	81	42.40	0.012
194	0.63305D+00	0.63699D+00	13.00	43	43.60	81	42.40	43	44.50	81	42.50	0.032
195	0.10082D+01	0.10082D+01	13.00	43	44.50	81	42.50	43	44.50	81	42.50	0.528
196	0.36897D+00	0.34053D+00	38.00	42	2.30	82	43.30	42	2.20	82	44.50	0.293
197	-0.66040D+01	-0.66130D+01	12.00	42	1.70	82	44.00	42	1.60	82	44.20	0.143
198	0.32766D+01	0.32194D+01	12.00	42	0.80	82	49.50	42	0.0	82	50.50	0.023
199	0.91440D+01	0.90773D+01	12.00	42	0.0	82	50.50	41	59.10	82	51.90	0.018
200	-0.60198D+01	-0.60632D+01	12.00	41	59.10	82	51.90	41	59.20	82	54.90	0.012
201	0.64008D+01	0.63807D+01	12.00	41	59.20	82	54.90	41	59.30	82	56.50	0.022
202	0.17018D+01	0.17180D+01	12.00	41	59.30	82	56.50	41	59.90	82	57.30	0.030
203	-0.37338D+01	-0.36994D+01	12.00	41	59.90	82	57.30	42	1.50	83	0.20	0.009
204	0.64770D+01	0.64013D+01	12.00	42	1.50	83	0.20	42	3.60	83	2.40	0.009
205	0.24892D+01	0.24865D+01	12.00	42	3.60	83	2.40	42	3.80	83	3.20	0.041
206	-0.61722D+01	-0.61913D+01	12.00	42	3.80	83	3.20	42	3.90	83	4.60	0.025
207	-0.40640D+00	-0.45733D+00	12.00	42	3.90	83	4.60	42	3.70	83	6.80	0.016
208	0.20320D+01	0.21056D+01	12.00	42	5.10	83	6.80	42	6.30	83	6.60	0.020
209	-0.56134D+01	-0.55425D+01	12.00	42	8.10	83	6.90	42	9.10	83	6.60	0.024
210	-0.11963D+02	-0.11799D+02	12.00	42	9.10	83	6.60	42	11.20	83	5.60	0.011
211	0.33020D+00	0.49111D+00	12.00	42	11.20	83	5.60	42	13.60	83	6.20	0.010
212	-0.68580D+00	-0.55600D+00	12.00	42	13.60	83	6.20	42	15.30	83	6.20	0.014
213	-0.14224D+01	-0.14224D+01	12.00	42	15.30	83	6.20	42	15.30	83	6.20	0.450
214	0.32766D+01	0.34434D+01	12.00	42	15.30	83	6.20	42	17.10	83	5.20	0.013
215	-0.12700D+01	-0.11338D+01	12.00	42	17.10	83	5.20	42	18.50	83	4.30	0.016
216	0.27940D+01	0.30126D+01	12.00	42	18.50	83	4.30	42	19.70	82	58.60	0.006
217	-0.17272D+01	-0.16350D+01	12.00	42	19.70	82	58.60	42	20.40	82	56.80	0.017
218	0.51308D+01	0.51404D+01	12.00	42	20.40	82	56.80	42	20.30	82	55.70	0.032
219	-0.27178D+01	-0.27689D+01	12.00	42	20.30	82	55.70	42	20.00	82	57.20	0.023
220	0.29718D+01	0.29253D+01	12.00	42	20.00	82	57.20	42	18.70	82	53.20	0.008
221	-0.16286D+01	-0.16108D+01	12.00	42	18.70	82	53.20	42	18.70	82	52.20	0.035

222	0.16695D+01	0.15384D+01	44.00	44	49.00	81	12.70	44	52.10	81	14.20	0.062
223	-0.13716D+01	-0.16654D+01	44.00	44	52.10	81	14.20	44	58.20	81	17.30	0.032
224	0.10668D+01	0.12939D+01	44.00	44	58.20	81	17.30	45	1.40	81	22.10	0.044
225	0.13508D+01	0.12978D+01	44.00	45	1.40	81	22.10	45	4.20	81	24.60	0.062
226	-0.35745D+01	-0.38987D+01	44.00	45	4.20	81	24.60	45	7.50	81	25.70	0.050
227	-0.25769D+01	-0.23459D+01	44.00	45	7.50	81	25.70	45	10.40	81	31.10	0.043
228	-0.46228D+01	-0.46303D+01	6.00	42	35.40	61	31.80	42	34.80	81	32.70	0.007
229	-0.74168D+01	-0.74283D+01	6.00	42	34.80	81	32.70	42	34.10	81	33.80	0.006
230	-0.18796D+01	-0.18919D+01	6.00	42	34.10	81	33.80	42	33.20	81	34.90	0.005
231	0.20320D+01	0.20099D+01	6.00	42	33.20	81	34.90	42	32.20	81	36.40	0.004
232	0.13208D+01	0.13027D+01	6.00	42	32.20	81	36.40	42	31.20	81	37.50	0.005
233	-0.16180D+02	-0.16614D+02	12.00	42	13.20	82	9.50	42	9.40	82	18.70	0.003
234	-0.14935D+02	-0.15328D+02	12.00	42	9.40	82	18.70	42	5.90	82	26.80	0.004
235	-0.24892D+01	-0.25103D+01	12.00	42	5.90	82	26.80	42	5.80	82	27.40	0.057
236	-0.49784D+01	-0.50346D+01	12.00	42	2.80	82	36.10	42	1.70	82	36.20	0.022
237	0.52324D+01	0.52400D+01	12.00	42	1.70	82	36.20	42	1.50	82	35.50	0.047
238	-0.30480D+00	-0.30621D+00	12.00	42	1.50	82	35.50	42	1.20	82	35.00	0.053
239	-0.23368D+01	-0.23484D+01	12.00	42	1.20	82	35.00	42	0.60	82	34.40	0.033
240	0.10160D+00	0.89970D-01	12.00	42	0.60	82	34.40	41	59.70	82	33.40	0.021
241	0.53340D+00	0.52382D+00	12.00	41	59.70	82	33.40	41	58.90	82	32.60	0.025
242	-0.10922D+01	-0.11041D+01	12.00	41	58.90	82	32.60	41	58.20	82	32.10	0.031
243	0.25400D+00	0.25208D+00	12.00	41	58.20	82	32.10	41	57.90	82	31.80	0.067
244	0.10160D+00	0.78962D-01	12.00	41	57.90	82	31.80	41	56.80	82	31.30	0.021
245	0.18034D+01	0.17847D+01	12.00	41	56.80	82	31.30	41	55.70	82	30.80	0.021
246	-0.33782D+01	-0.34059D+01	12.00	41	55.70	82	30.80	41	54.50	82	30.60	0.020
247	0.60813D+01	0.60383D+01	62.00	44	33.80	80	56.80	44	31.00	80	54.80	0.208
248	0.27825D+01	0.29064D+01	62.00	44	31.00	80	54.80	44	27.20	80	53.40	0.165
249	0.87015D+00	0.59002D+00	62.00	44	27.20	80	53.40	44	25.80	80	53.80	0.272
250	0.83574D-01	-0.16600D+00	62.00	44	25.80	80	50.60	44	23.40	80	47.40	0.199
251	0.20089D+00	-0.47220D+00	44.00	44	35.00	80	49.70	44	35.50	80	45.40	0.068
252	0.12434D+02	0.10906D+02	44.00	44	35.50	80	45.40	44	37.20	80	36.70	0.237
253	-0.80772D+01	-0.81285D+01	44.00	44	37.20	80	36.70	44	36.50	80	35.90	0.229
254	-0.62135D+01	-0.61946D+01	44.00	44	36.50	80	36.20	44	36.30	80	35.20	1.020
255	0.67056D+01	0.59118D+01	44.00	44	36.30	80	35.20	44	34.60	80	28.70	0.043
256	-0.21475D+00	-0.16129D+00	44.00	44	37.60	80	28.70	44	33.90	80	26.60	0.051
257	0.65809D+00	0.29968D+00	44.00	44	33.60	80	27.10	44	32.20	80	23.70	0.075
258	-0.18788D+01	-0.20782D+01	61.00	42	24.50	82	9.80	42	22.10	82	14.90	0.148
259	-0.39624D+01	-0.42734D+01	61.00	42	22.10	82	14.90	42	19.50	82	25.80	0.079
260	-0.65561D+00	-0.16368D+01	53.00	44	11.70	78	46.60	44	14.90	78	44.70	0.137
261	-0.13208D+01	-0.13932D+01	12.00	44	44.80	79	42.00	44	45.30	79	41.90	0.048
262	-0.26416D+01	-0.28267D+01	12.00	44	45.30	79	41.90	44	46.40	79	41.50	0.021
263	-0.14986D+01	-0.14956D+01	12.00	44	46.40	79	41.50	44	47.30	79	42.20	0.024
264	-0.16764D+01	-0.15674D+01	12.00	44	47.30	79	42.20	44	47.80	79	43.30	0.027
265	0.76454D+01	0.75861D+01	12.00	44	47.80	79	43.30	44	48.20	79	43.20	0.060
266	-0.60251D+00	-0.63119D+00	43.00	44	35.20	79	52.10	44	35.20	79	51.90	1.416
267	0.32323D+01	0.32810D+01	43.00	44	35.20	79	51.90	44	36.00	79	52.90	0.185
268	-0.36363D+01	-0.36328D+01	43.00	44	36.00	79	52.90	44	38.60	79	55.00	0.066
269	-0.63795D-01	-0.20415D-01	43.00	44	38.60	79	55.00	44	41.10	79	57.20	0.067
270	0.22801D+01	0.20478D+01	52.00	44	45.00	79	53.20	44	44.80	79	51.50	0.384
271	-0.27901D+01	-0.32826D+01	52.00	44	44.80	79	51.50	44	44.80	79	48.20	0.201
272	0.64477D+01	0.62533D+01	52.00	44	44.80	79	48.20	44	43.50	79	45.90	0.223
273	-0.61839D+01	-0.65914D+01	52.00	44	43.50	79	45.90	44	43.70	79	43.30	0.253
274	-0.10363D+02	-0.10324D+02	8.00	42	57.00	79	14.90	42	56.80	79	14.90	0.054
275	0.99060D+00	0.10513D+01	8.00	42	53.50	79	14.70	42	53.20	79	15.10	0.027
276	-0.14097D+01	-0.13727D+01	8.00	42	53.20	79	15.10	42	53.00	79	15.10	0.054
277	0.80010D+00	0.83698D+00	8.00	42	53.00	79	15.10	42	52.80	79	15.10	0.054
278	-0.22860D+00	-0.15528D+00	8.00	42	52.80	79	15.10	42	52.40	79	15.10	0.027
279	-0.17907D+01	-0.17971D+01	8.00	42	53.50	79	14.70	42	53.50	79	14.20	0.031
280	-0.10135D+02	-0.10202D+02	8.00	42	53.50	79	14.20	42	53.50	79	10.00	0.004
281	0.30861D+01	0.31035D+01	8.00	42	53.50	79	10.00	42	53.00	79	6.80	0.005
282	0.56388D+01	0.56914D+01	8.00	42	53.00	79	6.80	42	52.50	79	5.60	0.011

283	0.20955D+01	0.20572D+01	8.00	42	53.00	79	3.20	42	53.10	79	2.50	0.022
284	-0.10820D+02	-0.11725D+02	8.00	42	53.10	79	0.70	42	57.40	78	54.80	0.002
285	0.16383D+01	0.14953D+01	8.00	42	54.40	78	54.80	42	54.40	78	51.70	0.005
286	-0.14707D+02	-0.14929D+02	8.00	42	54.40	78	54.70	42	55.90	78	54.90	0.007
287	0.22098D+01	0.21696D+01	8.00	42	55.90	78	54.90	42	56.20	78	55.10	0.033
288	0.26670D+00	0.21415D+00	8.00	42	56.20	78	55.10	42	56.70	78	55.90	0.015
289	0.32385D+01	0.32356D+01	8.00	42	56.70	78	55.90	42	56.90	78	56.80	0.017
290	0.41705D+01	0.39362D+01	19.00	49	0.20	88	12.50	49	1.20	88	15.00	0.031
291	0.29905D+01	0.27557D+01	53.00	49	0.20	88	12.50	49	1.20	88	15.00	0.238
292	-0.19438D+01	-0.24456D+01	53.00	48	59.60	88	1.50	49	1.20	88	2.30	0.280
293	-0.40257D+01	-0.44369D+01	53.00	48	58.20	87	59.90	48	59.60	86	1.50	0.266
294	0.35081D+01	0.32056D+01	53.00	48	56.10	87	55.00	48	57.30	87	57.50	0.226
295	0.75625D+01	0.75411D+01	53.00	48	55.40	87	50.80	48	56.10	87	55.00	0.159
296	0.18921D+01	0.17201D+01	53.00	48	54.30	87	43.10	48	55.30	87	46.40	0.191
297	-0.44397D+01	-0.47060D+01	53.00	48	52.30	87	35.40	48	54.30	87	43.10	0.084
298	0.43132D+00	0.72462D+00	53.00	48	50.10	87	25.40	48	50.10	87	29.90	0.153
299	-0.71120D+00	-0.10965D+01	3.00	48	51.40	89	57.70	48	52.00	89	58.30	0.002
300	0.23368D+01	0.17546D+01	3.00	48	50.50	89	56.80	48	51.40	89	57.70	0.001
301	0.40640D+01	0.37464D+01	3.00	48	50.00	89	56.10	48	50.50	89	56.80	0.002
302	-0.17475D+02	-0.14041D+02	3.00	49	57.50	93	23.80	49	58.10	93	21.40	0.001
303	0.29718D+01	0.91401D+00	60.00	48	36.80	93	23.80	48	38.30	93	21.50	0.278
304	-0.24384D+01	-0.12445D+01	3.00	48	37.50	89	53.90	48	36.00	89	53.90	0.001
305	0.10770D+02	0.11282D+02	3.00	48	36.00	89	53.90	48	35.20	89	52.30	0.001
306	-0.35576D+01	-0.40119D+01	5.00	49	24.60	91	38.60	49	24.90	91	39.80	0.005
307	0.20499D+01	0.28875D+01	51.00	50	14.10	90	45.40	50	14.40	90	42.70	0.233
308	0.74706D+00	0.84291D+00	51.00	50	14.40	90	42.70	50	14.40	90	39.30	0.187
309	0.11748D+01	0.64203D+00	48.00	49	46.10	91	14.10	49	44.20	91	9.60	0.107
310	-0.10130D+01	-0.10249D+01	34.00	48	26.10	89	13.20	48	26.10	89	13.10	2.533
311	0.29852D+01	0.32146D+01	34.00	48	26.10	89	13.20	48	25.80	89	13.30	0.633
312	-0.17302D+01	-0.15971D+01	34.00	48	25.80	89	13.30	48	25.60	89	13.20	0.922
313	-0.51099D+00	-0.23286D+00	34.00	48	25.60	89	13.20	48	25.20	89	13.10	0.480
314	-0.10758D+00	-0.13073D+00	34.00	48	23.60	89	13.90	48	23.70	89	14.30	0.666
315	0.25280D+01	0.26868D+01	34.00	48	23.10	89	14.70	48	22.90	89	14.80	0.922
316	0.10130D+01	0.11592D+01	34.00	48	22.90	89	14.80	48	22.70	89	14.80	0.975
317	0.16316D+01	0.16189D+01	34.00	48	22.70	89	14.80	48	22.70	89	14.70	2.833
318	-0.12931D+00	-0.32894D+01	49.50	48	42.00	80	47.00	48	46.10	80	48.00	0.099
319	-0.29916D+01	-0.21670D+01	54.00	47	58.80	84	50.20	47	57.50	84	53.80	0.176
320	0.56083D+00	-0.67342D+00	50.00	49	17.50	81	47.50	49	16.50	81	44.50	0.184
321	-0.25043D+01	-0.22947D+01	37.00	48	15.00	82	26.50	48	14.00	82	25.50	0.190
322	-0.24714D-01	0.13660D-01	37.00	48	15.30	82	27.00	48	15.00	82	26.50	0.506
323	-0.94735D+00	-0.39695D+00	37.00	48	15.30	82	27.00	48	10.00	82	16.00	0.025
324	-0.32622D+01	-0.29606D+01	37.00	48	10.00	82	16.00	48	8.50	82	13.80	0.108
325	0.12604D+01	0.16851D+01	37.00	46	12.00	82	18.50	48	10.00	82	16.00	0.088
326	0.18593D+01	0.20281D+01	50.00	48	28.80	81	19.50	48	28.50	81	19.50	1.405
327	-0.10633D+01	-0.11370D+01	43.00	46	30.70	84	21.60	46	30.80	84	21.00	0.734
328	-0.16625D+01	-0.16518D+01	11.00	46	20.50	83	53.30	46	20.80	83	55.10	0.016
329	0.15794D+01	0.12727D+01	11.00	46	31.00	84	5.80	46	32.70	84	9.40	0.007
330	-0.45720D+00	-0.38346D+00	10.00	46	30.80	84	21.00	46	30.70	84	21.60	0.040
331	-0.66751D+01	-0.64884D+01	10.00	46	31.20	84	25.40	46	31.20	84	28.00	0.009
332	0.70104D+01	0.71126D+01	10.00	46	31.60	84	32.50	46	31.60	84	33.90	0.018
333	0.63177D+01	0.63704D+01	11.00	46	16.00	83	33.10	46	16.10	83	34.60	0.020
334	-0.83127D-01	-0.32361D+00	11.00	46	16.10	83	34.60	46	17.10	83	36.10	0.014
335	0.72044D+01	0.73076D+01	11.00	46	17.10	83	36.10	46	17.10	83	37.90	0.016
336	-0.83127D+01	-0.82326D+01	11.00	46	17.10	83	37.90	46	17.10	83	39.30	0.021
337	-0.56804D+01	-0.55223D+01	11.00	46	17.10	83	39.30	46	17.00	83	41.50	0.013
338	0.96982D+00	0.92062D+00	11.00	46	17.00	83	41.50	46	17.40	83	42.90	0.020
339	0.40178D+01	0.40034D+01	11.00	46	17.40	83	42.90	46	17.80	83	44.90	0.014
340	-0.71212D+01	-0.71143D+01	11.00	46	17.80	83	44.90	46	18.10	83	46.70	0.016
341	-0.16625D+01	-0.16897D+01	11.00	46	18.00	83	47.50	46	18.30	83	48.70	0.023
342	-0.66502D+01	-0.67324D+01	11.00	46	18.30	83	48.70	46	18.90	83	50.60	0.014
343	-0.67857D+01	-0.68514D+01	11.00	46	18.90	83	50.60	46	19.40	83	52.10	0.018

344	0.19396D+01	0.19663D+01	11.00	46	19.40	83	52.10	46	20.20	83	56.90	0.006
345	-0.16625D+01	-0.15448D+01	11.00	46	20.20	83	56.90	46	20.20	83	58.90	0.015
345	-0.22167D+01	-0.21050D+01	11.00	46	20.20	83	58.90	46	20.20	84	0.80	0.016
347	-0.39901D+01	-0.49287D+01	11.00	46	25.60	84	4.10	46	28.50	84	4.10	0.007
348	-0.89941D-01	0.11724D+00	61.00	45	19.00	79	59.40	45	20.40	80	1.80	0.290
349	-0.17489D+00	-0.12346D+00	61.00	45	20.40	80	1.80	45	20.60	80	2.30	1.577
350	-0.21486D+00	-0.22019D+00	61.00	45	20.60	80	2.30	45	24.40	80	5.00	0.148
351	0.13991D+01	0.15008D+01	61.00	45	24.40	80	5.00	45	25.20	80	6.80	0.336
352	0.64957D-01	0.46800D+00	61.00	45	25.80	80	6.80	45	26.30	80	11.80	0.148
353	0.10543D+01	0.13166D+01	61.00	45	28.30	80	11.80	45	29.70	80	15.00	0.240
354	0.20786D+01	0.22459D+01	61.00	45	29.70	80	15.00	45	33.10	80	19.50	0.136
355	-0.19387D+01	-0.19013D+01	61.00	45	33.10	80	19.50	45	35.80	80	22.60	0.182
356	0.95437D+00	0.93227D+00	61.00	45	35.80	80	22.60	45	40.10	80	27.40	0.115
357	-0.22985D+00	-0.44119D+00	61.00	45	40.10	80	27.40	45	43.00	80	29.30	0.197
358	0.11193D+01	0.94816D+00	61.00	45	43.00	80	29.30	45	46.50	80	31.80	0.161
359	0.25983D+00	-0.45128D+00	61.00	45	46.50	80	31.80	45	51.90	80	33.60	0.113
360	0.47969D+00	0.72309D-01	61.00	45	51.90	80	33.60	45	53.30	80	31.90	0.344
361	0.27482D+00	-0.28697D+00	61.00	45	53.30	80	31.90	45	56.20	80	31.30	0.214
362	-0.41972D+00	-0.11811D+01	61.00	45	56.20	80	31.30	46	2.70	80	36.50	0.085
363	0.60460D+00	0.32099D+00	61.00	46	2.70	80	36.50	46	5.10	80	39.00	0.212
364	-0.12442D+01	-0.15561D+01	61.00	46	5.10	80	39.00	46	7.10	80	40.40	0.283
365	0.12942D+01	0.10235D+01	61.00	46	7.10	80	40.40	46	8.80	80	41.70	0.327
366	-0.14990D-01	-0.81435D+00	61.00	46	8.80	80	41.70	46	13.20	80	44.50	0.131
367	-0.76450D+00	-0.11384D+01	61.00	46	13.20	80	44.50	46	15.30	80	46.40	0.254
368	0.13491D+00	-0.82876D-01	61.00	46	15.30	80	46.50	46	16.30	80	46.90	0.605
369	0.11343D+01	0.63823D+00	61.00	46	16.30	80	46.90	46	18.50	80	47.70	0.277
370	-0.94936D-01	-0.76217D+00	61.00	46	18.50	80	47.70	46	21.10	80	47.60	0.241
371	-0.23485D+00	-0.10155D+01	61.00	46	21.10	80	47.60	46	24.50	80	49.70	0.170
372	0.74645D+00	0.68894D+00	49.00	46	26.70	80	19.90	46	26.20	80	16.50	0.169
373	0.43729D+01	0.43461D+01	49.00	46	25.80	80	13.20	46	25.30	80	10.60	0.218
374	-0.57041D+01	-0.58368D+01	49.00	46	25.30	80	10.60	46	21.30	79	56.10	0.078
375	-0.14954D+02	-0.14916D+02	49.00	46	21.90	79	56.10	46	22.10	79	55.70	1.190
376	-0.82420D+01	-0.88023D+01	49.00	46	21.90	79	56.10	46	22.10	79	47.50	0.068
377	-0.37944D+01	-0.38598D+01	49.00	46	19.50	79	29.90	46	19.00	79	28.00	0.289
378	0.55984D+00	0.15847D+00	49.00	46	22.10	79	47.50	46	21.30	79	39.00	0.069
379	-0.32346D+01	-0.35761D+01	49.00	46	21.30	79	39.00	46	19.50	79	29.90	0.062
380	0.10160D+01	0.15226D+01	55.50	46	17.60	81	41.60	46	16.90	81	46.50	0.151
381	-0.12631D+01	-0.60593D+00	55.50	46	16.90	81	46.50	46	16.00	81	52.80	0.117
382	-0.10352D+02	-0.94112D+01	55.50	46	16.00	81	52.80	46	14.00	81	58.00	0.127
383	0.98854D+01	0.10438D+02	55.50	46	14.00	81	58.00	46	13.10	82	2.40	0.164
384	0.51624D+01	0.53364D+01	55.50	46	13.10	82	2.40	46	12.90	82	4.20	0.414
385	-0.46406D+01	-0.43663D+01	55.50	46	12.90	82	4.20	46	12.50	82	6.60	0.306
386	0.27075D+01	0.38778D+01	55.50	46	12.50	82	6.60	46	12.30	82	24.60	0.042
387	0.32567D+01	0.44681D+01	55.50	46	12.30	82	24.60	46	11.90	82	42.50	0.042
388	0.33281D+01	0.44663D+01	55.50	46	11.90	82	42.50	46	11.10	82	57.30	0.051
389	-0.67112D+00	-0.65373D+00	54.50	46	30.70	84	19.60	46	30.60	84	19.40	2.944
390	-0.96473D+01	-0.97827D+01	54.50	46	30.60	84	19.40	46	31.30	84	20.60	0.463
391	-0.38100D+01	-0.42285D+01	54.00	46	31.30	84	20.60	46	32.90	84	21.80	0.273
392	0.24666D+01	0.17556D+01	54.00	46	34.60	84	19.40	46	36.30	84	17.30	0.220
393	0.12644D+01	0.50258D+00	54.00	46	36.30	84	17.30	46	38.80	84	18.10	0.192
394	-0.27771D+01	-0.19525D+01	54.00	47	58.80	84	50.20	47	57.50	84	53.80	0.176
395	-0.67377D+00	-0.16719D+00	47.50	46	17.60	81	41.60	46	16.90	81	46.50	0.110
396	0.12644D+01	0.50258D+00	54.00	46	36.30	84	17.30	46	38.80	84	18.10	0.192
397	-0.21866D+00	-0.34085D+00	46.00	45	0.50	75	38.30	45	0.80	75	38.50	1.081
398	-0.38895D+01	-0.32901D+01	46.00	45	0.60	75	34.40	45	0.50	75	38.30	0.133
399	-0.18089D+01	-0.78165D+00	46.00	45	3.10	75	26.30	45	2.10	75	29.70	0.140
400	0.72887D+00	0.81803D+00	46.00	45	6.30	75	13.80	45	6.10	75	13.70	1.687
401	0.10270D+01	0.83375D+00	46.00	45	4.90	75	20.70	45	5.40	75	21.10	0.625
402	-0.19878D+00	-0.28469D+00	46.00	45	5.40	75	21.10	45	5.00	75	21.20	1.687
403	-0.80772D+01	-0.80772D+01	4.00	45	2.50	79	20.00	45	2.50	79	20.00	0.050
404	-0.38867D+01	-0.38847D+01	4.00	45	2.50	79	20.00	45	2.80	79	20.20	0.000

405	0.10211D+02	0.10181D+02	2.00	45	6.30	79	20.20	45	6.80	79	20.30	0.001
406	0.21336D+01	0.22736D+01	4.00	45	18.50	79	57.70	45	18.70	79	58.80	0.003
407	-0.98298D+01	-0.98299D+01	4.00	45	18.70	79	58.80	45	19.00	79	59.00	0.008
408	-0.91440D+01	-0.91736D+01	4.00	45	19.00	79	59.00	45	19.90	79	59.40	0.003
409	0.16002D+01	0.16375D+01	4.00	45	19.90	79	59.40	45	20.40	80	0.0	0.004
410	0.69342D+01	0.69222D+01	4.00	45	20.90	80	0.50	45	21.60	80	0.90	0.004
411	-0.32232D+00	-0.70857D-01	43.50	45	27.10	80	1.00	45	25.70	80	1.80	0.133
412	-0.38287D+00	-0.74975D+00	43.50	45	25.70	80	1.80	45	24.10	80	1.60	0.124
413	0.49048D-01	0.18297D+00	43.50	45	24.10	80	1.60	45	22.90	80	1.70	0.166
414	0.18358D+01	0.20500D+01	43.50	45	22.90	80	1.70	45	20.60	80	1.60	0.087
415	0.25706D+01	0.28313D+01	41.50	45	51.30	77	12.60	45	51.90	77	13.80	0.178
416	0.89163D+01	0.96454D+01	41.50	45	51.90	77	13.80	45	53.90	77	17.00	0.061
417	0.16232D+01	0.30660D+01	41.50	45	53.90	77	17.00	45	58.60	77	23.00	0.029
418	0.15130D+01	0.20207D+01	41.50	45	58.60	77	23.00	45	59.90	77	25.40	0.086
419	0.62429D+00	0.96573D+00	41.50	45	59.90	77	25.40	46	1.00	77	26.90	0.120
420	-0.70508D+00	-0.69511D+00	41.50	46	1.00	77	26.90	46	1.10	77	26.90	1.815
421	-0.50678D+00	0.90595D+00	41.50	46	1.10	77	26.90	46	7.40	77	32.30	0.025
422	0.12412D+01	0.16626D+01	41.50	46	7.40	77	32.30	46	8.80	77	34.40	0.090
423	-0.31508D+01	-0.26539D+01	41.50	46	8.80	77	34.40	46	10.00	77	37.30	0.078
424	0.34520D+01	0.35051D+01	41.50	46	10.00	77	37.30	46	10.00	77	37.70	0.659
425	0.72711D+00	0.90763D+00	41.50	46	10.00	77	37.70	46	10.90	77	38.50	0.172
426	-0.25339D+01	-0.25261D+01	41.50	46	11.40	77	41.00	46	11.50	77	41.00	1.815
427	0.32431D+01	0.32748D+01	37.50	44	46.50	79	20.30	44	45.80	79	19.90	0.197
428	-0.12090D+02	-0.12028D+02	3.00	46	18.10	79	24.30	46	18.30	79	25.50	0.002
429	0.38608D+01	0.38825D+01	3.00	46	18.30	79	25.50	46	18.30	79	25.80	0.007
430	0.95504D+01	0.96226D+01	3.00	42	16.30	82	25.80	42	16.60	82	22.70	0.001
431	-0.12192D+01	-0.12019D+01	3.00	42	16.60	82	22.70	42	16.80	82	22.40	0.005
432	0.83820D+01	0.83966D+01	2.00	42	21.50	82	7.30	42	22.10	82	8.50	0.001
433	-0.11278D+02	-0.11282D+02	2.00	42	22.10	82	8.50	42	22.00	82	8.50	0.007
434	-0.50800D+01	-0.50873D+01	9.00	42	59.10	82	24.20	42	59.20	82	23.70	0.038
435	-0.25739D+01	-0.26422D+01	9.00	42	59.20	82	23.70	42	59.20	82	21.50	0.009
436	0.51368D+01	0.49316D+01	34.00	42	57.50	81	37.90	42	55.10	81	31.20	0.038
437	-0.17929D-01	-0.52472D-01	34.00	42	55.10	81	31.20	42	54.50	81	29.70	0.163
438	-0.56478D+00	-0.56712D+00	34.00	42	54.50	81	29.70	42	54.50	81	29.60	2.833
439	0.32512D+01	0.32535D+01	3.00	42	54.50	81	29.60	42	54.50	81	29.70	0.022
440	0.26572D+00	0.27834D+00	39.00	42	46.80	81	11.70	42	46.50	81	12.20	0.562
441	0.26963D+01	0.29795D+01	39.00	42	46.50	81	12.20	42	40.40	81	12.80	0.042
442	0.32886D+00	0.34148D+00	38.00	42	46.80	81	11.70	42	46.50	81	12.20	0.533
443	-0.35560D+01	-0.35592D+01	3.00	42	53.10	80	6.70	42	53.10	80	6.90	0.011
444	0.55880D+01	0.57802D+01	3.00	42	53.10	80	6.90	42	51.90	80	7.70	0.001
445	0.14783D+02	0.14799D+02	2.00	43	10.00	80	15.90	43	10.00	80	16.90	0.001
446	-0.96774D+01	-0.96757D+01	4.00	43	15.40	79	56.10	43	15.40	79	56.20	0.039
447	-0.21539D+01	-0.21534D+01	15.00	43	9.90	79	11.70	43	9.90	79	11.80	0.551
448	-0.34466D+01	-0.34768D+01	13.00	43	21.80	80	58.60	43	22.30	80	58.60	0.057
449	-0.51582D+00	-0.48955D+00	13.00	43	22.30	80	58.60	43	22.40	80	59.10	0.080
450	-0.31652D+01	-0.31712D+01	13.00	43	22.40	80	59.10	43	22.50	80	59.10	0.285
451	-0.58211D+01	-0.54389D+01	51.00	43	24.60	80	39.30	43	22.70	80	42.80	0.143
452	0.17690D+01	0.27617D+01	51.00	43	22.70	80	42.80	43	22.30	80	58.60	0.040
453	0.10220D+01	0.10522D+01	51.00	43	22.30	80	58.60	43	21.80	80	58.60	0.877
454	0.63500D-02	-0.91560D-01	48.00	43	26.40	80	29.50	43	27.30	80	29.60	0.430
455	-0.14605D+00	-0.12784D+00	48.00	43	27.30	80	29.60	43	28.10	80	31.40	0.263
456	-0.12764D+01	-0.12552D+01	48.00	43	28.10	80	31.40	43	27.80	80	31.20	1.177
457	0.19771D+00	0.20921D+00	37.00	43	26.70	80	29.90	43	26.40	80	29.50	0.567
458	-0.15240D+02	-0.15310D+02	1.00	43	28.10	80	31.40	43	28.40	80	30.80	0.000
459	-0.70104D+01	-0.70613D+01	1.00	43	29.20	80	31.50	43	29.90	80	31.90	0.000
460	-0.16764D+02	-0.16727D+02	1.00	43	37.50	80	8.50	43	37.30	80	8.60	0.001
461	0.0	0.30302D-01	4.00	43	28.70	80	25.70	43	28.50	80	25.80	0.013
462	-0.29718D+01	-0.29478D+01	4.00	43	28.50	80	25.80	43	28.40	80	26.00	0.016
463	0.0	0.29841D-01	4.00	43	28.40	80	26.00	43	28.30	80	26.30	0.012
464	0.0	0.11824D-01	4.00	43	28.30	80	26.30	43	28.30	80	26.50	0.020
465	-0.45720D+00	-0.36805D+00	4.00	43	28.30	80	26.50	43	28.00	80	27.40	0.004

466	-0.38100D+00	-0.35139D+00	4.00	43	27.80	80	28.00	43	27.80	80	28.50	0.008
467	0.0	-0.17438D-01	4.00	43	27.60	80	28.50	43	27.80	80	28.60	0.013
468	-0.20683D+01	-0.20317D+01	14.00	43	37.50	80	8.50	43	37.30	80	8.60	0.156
469	-0.69233D+01	-0.65832D+01	14.00	43	37.30	80	8.60	43	35.80	80	10.40	0.017
470	-0.45938D+01	-0.42792D+01	14.00	43	35.80	80	10.40	43	34.30	80	11.90	0.018
471	0.40930D+01	0.45288D+01	14.00	43	34.30	80	11.90	43	32.50	80	14.80	0.012
472	-0.75184D+01	-0.73665D+01	3.00	43	49.80	80	32.00	43	49.80	80	33.50	0.001
473	0.12023D+01	0.11859D+01	18.00	43	58.80	80	44.30	43	59.00	80	44.30	0.273
474	-0.10886D-01	0.31016D-01	56.00	43	42.30	80	22.80	43	42.30	80	23.30	1.537
475	0.80010D+01	0.80010D+01	4.00	43	17.90	79	47.80	43	17.90	79	47.80	0.050
476	0.14859D+02	0.14974D+02	4.00	43	17.90	79	47.80	43	17.30	79	47.50	0.004
477	0.11430D+02	0.11541D+02	4.00	43	17.30	79	47.50	43	16.70	79	46.90	0.004
478	0.38100D+01	0.39849D+01	4.00	43	16.70	79	46.90	43	15.80	79	46.40	0.003
479	-0.58347D+01	-0.57040D+01	7.00	43	5.30	79	56.80	43	4.60	79	57.00	0.012
480	-0.45285D+01	-0.45100D+01	7.00	43	4.60	79	57.00	43	4.50	79	57.20	0.049
481	0.15240D+01	0.15510D+01	9.00	43	15.50	79	54.80	43	15.40	79	55.30	0.038
482	-0.19543D+01	-0.19946D+01	17.00	44	30.70	80	55.20	44	33.80	80	56.80	0.009
483	0.15240D+01	0.15384D+01	1.00	44	33.80	80	56.80	44	33.80	80	56.90	0.002
484	0.32512D+00	0.33950D+00	45.00	44	33.80	80	56.80	44	33.80	80	56.90	3.101
485	0.56444D-01	0.81679D-01	27.00	43	50.20	80	50.90	43	50.00	80	51.00	0.581
486	0.73378D+00	0.69407D+00	27.00	43	50.00	80	51.00	43	50.40	80	50.90	0.303
487	0.25400D+01	0.29382D+01	27.00	43	50.40	80	50.90	43	48.40	80	53.30	0.047
488	0.92082D+01	0.90844D+01	38.00	42	1.70	82	36.20	42	2.30	82	43.30	0.049
489	0.36897D+00	0.34053D+00	38.00	42	2.30	82	43.30	42	2.20	82	44.50	0.293
490	-0.11470D+01	-0.10790D+01	38.00	42	16.80	83	1.10	42	17.70	83	1.40	0.264
491	0.16256D+01	0.16124D+01	3.00	42	24.40	82	10.90	42	24.20	82	11.10	0.006
492	-0.30480D+00	-0.29293D+00	3.00	42	24.20	82	11.10	42	24.40	82	11.00	0.007
493	-0.63190D+00	-0.62701D+00	41.00	42	40.50	81	12.80	42	40.40	81	12.80	2.335
494	-0.11009D+02	-0.10868D+02	8.50	44	5.80	81	17.80	44	5.50	81	18.80	0.016
495	-0.22167D+00	-0.23110D+00	11.00	44	15.70	80	33.00	44	15.80	80	33.00	0.204
496	-0.61976D+01	-0.61879D+01	3.00	43	55.30	80	5.00	43	55.30	80	5.70	0.022
497	0.46736D+01	0.46887D+01	3.00	43	55.30	80	5.70	43	55.40	80	6.00	0.007
498	0.0	0.78079D-01	11.00	46	18.10	83	46.70	46	18.00	83	47.50	0.036
499	0.24384D+01	0.25480D+01	1.00	44	1.00	79	40.00	44	0.80	79	40.80	0.000
500	0.18390D+01	0.15722D+01	60.00	43	50.30	79	42.00	43	51.80	79	42.20	0.403
501	-0.46736D+01	-0.47683D+01	6.00	43	41.30	79	46.30	43	41.80	79	46.30	0.012
502	-0.74168D+01	-0.74496D+01	6.00	43	41.80	79	46.30	43	42.30	79	47.30	0.007
503	-0.98323D+01	-0.10038D+02	31.00	44	4.30	79	28.90	44	5.70	79	29.60	0.068
504	0.80865D+00	0.44349D+00	49.00	44	1.40	79	48.30	44	3.70	79	48.40	0.176
505	0.32657D+00	0.39632D+00	42.00	44	36.70	79	24.80	44	36.50	79	25.10	1.035
506	-0.12005D+01	-0.22208D+01	49.00	44	43.80	79	36.70	44	51.80	79	36.00	0.051
507	0.22082D+01	0.19808D+01	49.00	44	51.80	79	36.00	44	54.20	79	36.20	0.168
508	-0.22497D+01	-0.19052D+01	42.00	43	44.00	79	19.60	43	42.80	79	20.90	0.199
509	-0.43906D+01	-0.42414D+01	42.00	43	42.80	79	20.90	43	42.00	79	20.00	0.294
510	0.70394D+01	0.74758D+01	42.00	43	42.00	79	20.00	43	40.80	79	23.50	0.111
511	-0.40640D+00	-0.63531D+00	6.00	43	40.00	79	28.30	43	41.00	79	28.20	0.006
512	-0.74894D+01	-0.76118D+01	3.50	44	1.00	79	35.50	44	1.80	79	35.80	0.003
513	-0.64443D+01	-0.65558D+01	3.50	44	1.80	79	35.80	44	2.50	79	36.00	0.003
514	0.99753D+00	0.11233D+01	11.00	44	3.50	79	27.70	44	3.00	79	28.00	0.038
515	0.26324D+01	0.25374D+01	11.00	44	3.00	79	28.00	44	3.30	79	27.60	0.050
516	-0.78334D+01	-0.73392D+01	10.00	44	23.40	79	6.60	44	20.30	79	5.40	0.005
517	0.66142D+01	0.64155D+01	10.00	44	20.30	79	5.40	44	20.70	79	4.30	0.020
518	-0.16429D+01	-0.17676D+01	41.00	44	29.30	79	9.00	44	30.00	79	9.00	0.253
519	0.85047D+01	0.82808D+01	41.00	44	30.00	79	9.00	44	32.00	79	10.00	0.084
520	0.24267D+01	0.27255D+01	52.00	44	32.00	79	10.00	44	35.00	79	16.10	0.088
521	0.32431D+01	0.32490D+01	37.50	44	46.50	79	20.30	44	46.00	79	19.90	0.260
522	0.48006D+01	0.47440D+01	8.00	44	18.30	77	57.30	44	18.50	77	57.50	0.044
523	0.60158D+01	0.51154D+01	38.00	43	58.80	78	37.00	44	1.80	78	36.90	0.051
524	-0.59516D+01	-0.65612D+01	38.00	44	1.80	78	36.90	44	4.00	78	37.60	0.068
525	0.62702D+01	0.60695D+01	7.00	44	22.80	77	59.00	44	23.30	77	58.50	0.014
526	-0.18885D+00	0.11263D+01	60.00	44	25.90	77	53.90	44	23.10	77	59.10	0.092

527	-0.10485D+01	-0.65345D+00	50.00	44	23.10	77	59.10	44	22.40	78	1.40	0.244
528	-0.84526D+01	-0.85268D+01	41.00	44	18.50	79	5.00	44	19.00	79	5.30	0.328
529	-0.17099D+00	-0.11255D+00	41.00	44	15.90	79	4.30	44	15.50	79	4.00	0.394
530	0.91143D+01	0.96972D+01	41.00	44	15.50	79	4.00	44	12.20	79	2.30	0.051
531	-0.73970D+01	-0.67597D+01	41.00	44	12.20	79	2.30	44	9.00	79	1.00	0.053
532	0.79397D+01	0.84982D+01	41.00	44	9.00	79	1.00	44	6.30	78	59.80	0.063
533	-0.16561D+02	-0.16723D+02	3.00	44	16.90	78	42.20	44	17.60	78	42.40	0.002
534	0.67056D+01	0.63731D+01	3.00	44	17.60	78	42.40	44	19.20	78	43.20	0.001
535	0.19304D+01	0.17686D+01	3.00	44	19.20	78	43.20	44	20.00	78	43.60	0.002
536	-0.52832D+01	-0.54514D+01	3.00	44	20.00	78	43.60	44	20.80	78	43.90	0.002
537	-0.13919D+02	-0.13960D+02	3.00	44	20.80	78	43.90	44	21.20	78	44.50	0.003
538	-0.38629D+01	-0.43671D+01	49.00	44	39.50	78	47.90	44	42.50	78	48.10	0.135
539	0.18848D+01	0.17510D+01	49.00	44	42.50	78	48.10	44	43.60	78	48.50	0.357
540	-0.30169D+01	-0.34787D+01	49.00	44	43.60	78	48.50	44	46.60	78	48.70	0.135
541	-0.16111D+01	-0.26508D+01	49.00	44	46.60	78	48.70	44	48.30	78	43.10	0.096
542	0.77133D+00	0.11296D+01	49.00	44	48.30	78	43.10	44	49.30	78	46.80	0.148
543	0.12845D+01	0.11403D+01	14.00	44	31.30	78	46.40	44	32.50	78	47.30	0.024
544	-0.15240D+01	-0.16054D+01	14.00	44	32.50	78	47.30	44	32.90	78	47.30	0.083
545	-0.12878D+01	-0.13163D+01	40.00	44	25.20	78	16.40	44	25.30	78	16.40	1.686
546	0.28448D+01	0.21891D+01	30.00	44	32.30	78	32.70	44	34.40	78	31.10	0.040
547	0.63190D+00	0.19478D+00	41.00	44	30.20	78	44.50	44	32.20	78	44.40	0.142
548	0.11151D+01	0.10827D+01	41.00	44	32.20	78	44.40	44	32.30	78	44.30	2.335
549	0.20955D+01	0.21182D+01	8.00	44	26.00	77	53.50	44	26.00	77	53.80	0.052
550	-0.48387D+01	-0.47347D+01	8.00	44	26.00	77	53.80	44	25.80	77	54.30	0.027
551	0.10488D+02	0.10883D+02	49.00	44	23.10	77	59.10	44	22.40	78	1.40	0.234
552	0.83820D+01	0.87050D+01	2.00	44	33.30	77	19.30	44	32.50	77	19.50	0.001
553	0.25831D-01	0.34701D-01	59.00	44	54.20	76	15.40	44	54.10	76	15.10	2.559
554	0.20664D+00	0.19108D+01	59.00	44	54.10	76	15.10	44	52.20	76	22.80	0.104
555	0.28930D+00	0.10066D+01	59.00	44	52.20	76	22.80	44	51.30	76	25.80	0.261
556	-0.26709D+01	-0.25091D+01	59.00	44	43.00	76	53.60	44	43.10	76	55.80	0.387
557	0.45462D+00	0.95769D+00	59.00	44	43.10	76	53.30	44	42.50	76	58.70	0.282
558	0.45443D+01	0.42994D+01	11.00	44	38.80	77	7.50	44	39.50	77	7.80	0.028
559	0.30480D+00	0.38519D+00	5.00	44	28.70	77	18.70	44	28.50	77	18.70	0.021
560	0.38481D+01	0.40911D+01	8.00	44	33.30	78	13.10	44	32.80	78	14.20	0.012
561	0.64770D+00	0.63762D+00	8.00	44	32.80	78	14.20	44	32.80	78	14.10	0.157
562	-0.38100D-01	-0.64449D-01	8.00	44	32.80	78	14.10	44	32.90	78	14.10	0.108
563	0.27432D+01	0.30417D+01	8.00	44	19.00	78	18.90	44	18.30	78	20.10	0.010
564	-0.15773D+02	-0.16175D+02	8.00	44	19.30	78	20.10	44	21.20	78	22.00	0.005
565	0.16764D+01	0.17049D+01	8.00	44	25.30	78	16.40	44	25.20	78	16.40	0.108
566	-0.20574D+01	-0.17631D+01	8.00	44	25.20	78	16.40	44	24.00	78	15.80	0.009
567	0.50673D+01	0.50735D+01	8.00	44	33.50	78	12.50	44	33.40	78	12.30	0.063
568	-0.52959D+01	-0.53387D+01	8.00	44	33.40	78	12.30	44	33.60	78	12.40	0.051
569	-0.47244D+01	-0.47378D+01	8.00	44	33.60	78	12.40	44	34.20	78	13.80	0.010
570	-0.47244D+01	-0.45867D+01	8.00	44	33.80	78	20.40	44	33.50	78	21.00	0.021
571	0.57912D+01	0.58093D+01	8.00	44	33.50	78	21.00	44	33.30	78	20.70	0.038
572	0.14859D+01	0.12487D+01	8.00	44	15.90	77	47.60	44	16.50	77	47.30	0.017
573	-0.63782D+00	-0.16190D+01	54.00	44	11.70	78	46.60	44	14.90	78	44.70	0.142
574	-0.46172D+01	-0.45468D+01	54.00	44	21.10	78	43.50	44	21.20	78	44.50	0.707
575	-0.21844D+01	-0.21970D+01	12.00	44	35.80	78	56.30	44	35.80	78	56.20	0.353
576	0.87884D+01	0.88371D+01	12.00	44	35.80	78	56.20	44	35.60	78	56.30	0.115
577	-0.47383D+01	-0.48782D+01	11.00	44	46.20	79	21.00	44	46.50	79	20.30	0.036
578	0.66779D+01	0.70195D+01	11.00	44	46.50	79	20.30	44	46.10	79	22.30	0.014
579	-0.33251D+00	-0.34689D+00	44.00	44	33.80	80	56.90	44	33.80	80	56.80	2.965
580	-0.91440D+00	-0.86282D+00	13.00	42	26.70	82	14.10	42	27.70	82	15.40	0.021
581	-0.98474D+00	-0.89139D+00	13.00	42	27.70	82	15.40	42	29.30	82	17.30	0.014
582	-0.15006D+02	-0.14955D+02	13.00	42	29.30	82	17.30	42	30.10	82	18.40	0.026
583	0.11151D+02	0.11023D+02	12.00	42	2.20	82	45.30	42	1.20	82	49.50	0.008
584	-0.90424D+01	-0.90629D+01	12.00	42	1.20	82	49.50	42	0.80	82	49.50	0.061
585	0.45720D+00	0.12656D+00	44.00	44	40.80	81	8.10	44	44.50	81	8.30	0.055
586	0.17249D+01	0.19200D+01	44.00	45	10.40	81	31.10	45	12.70	81	35.80	0.051
587	0.57496D+00	-0.55886D+00	44.00	44	33.80	80	57.80	44	35.00	80	49.70	0.041

588	-0.26324D+00	-0.13102D+00	44.00	44	33.90	80	26.60	44	33.60	80	27.30	0.360
589	0.22860D+00	0.19927D+00	44.00	44	33.60	80	27.30	44	33.60	80	27.10	1.482
590	-0.17788D+01	-0.19521D+01	61.00	42	19.50	82	25.80	42	18.30	82	32.70	0.128
591	-0.25589D+01	-0.54322D+01	43.00	44	28.00	80	6.40	44	35.20	79	52.10	0.016
592	-0.13539D+01	-0.23217D+01	43.00	44	41.10	79	57.20	44	45.30	79	53.80	0.041
593	-0.49619D+00	-0.26295D+00	43.00	44	45.30	79	53.80	44	46.20	79	56.00	0.111
594	-0.14035D+01	-0.14607D+01	43.00	44	45.30	79	53.80	44	45.00	79	53.20	0.382
595	0.48768D+00	-0.28230D+00	10.00	44	42.60	79	38.70	44	42.70	79	33.50	0.005
596	-0.13252D+01	-0.13078D+01	11.50	46	30.50	84	19.70	46	30.40	84	19.50	0.131
597	-0.50358D+01	-0.50325D+01	11.50	46	16.90	83	32.90	46	17.10	83	34.10	0.026
598	-0.58220D+00	-0.57884D+00	44.50	46	16.90	83	32.90	46	17.10	83	34.10	0.393
599	0.70207D+01	0.70381D+01	44.50	46	16.90	83	32.90	46	20.50	83	53.30	0.023
600	0.82573D+01	0.97124D+01	11.00	46	32.70	84	9.40	46	30.40	84	19.50	0.003
601	0.10850D+02	0.11204D+02	54.50	45	31.60	84	20.60	46	30.70	64	21.60	0.442
602	-0.54187D+01	-0.54224D+01	9.00	46	28.40	80	51.70	46	28.70	80	53.40	0.011
603	-0.11176D+02	-0.11363D+02	9.00	46	29.30	80	59.60	46	30.00	81	0.0	0.018
604	0.51075D+01	0.47663D+01	37.00	46	19.70	79	22.10	46	21.20	79	19.90	0.108
605	0.35423D+01	0.29814D+01	37.00	46	21.20	79	19.90	46	25.40	79	19.90	0.055
606	0.57253D+01	0.55985D+01	37.00	46	25.40	79	19.90	46	27.20	79	22.20	0.096
607	0.20183D+01	0.18090D+01	37.00	46	27.20	79	22.20	46	29.10	79	23.80	0.105
608	-0.11533D+01	-0.12626D+01	37.00	46	29.10	79	23.80	46	29.70	79	23.60	0.375
609	0.10709D+01	0.79484D+00	37.00	46	29.70	79	23.60	46	31.80	79	25.20	0.097
610	-0.26670D+01	-0.30121D+01	36.00	47	30.40	79	41.20	47	30.90	79	40.50	0.315
611	-0.12357D+00	-0.10781D+00	37.00	46	19.00	79	28.00	46	18.50	79	27.30	0.332
612	0.24302D+01	0.68555D+00	37.00	46	58.10	79	44.40	47	3.10	79	47.70	0.042
613	0.16064D+01	-0.49096D+00	37.00	47	3.10	79	47.70	47	8.30	79	46.10	0.043
614	-0.37070D+00	-0.23411D+01	37.00	47	8.30	79	46.10	47	12.70	79	43.10	0.047
615	-0.91440D+01	-0.87373D+01	7.00	45	31.20	77	56.30	45	30.20	77	58.70	0.004
616	-0.65314D+01	-0.61518D+01	7.00	45	33.30	77	54.10	45	31.20	77	56.30	0.003
617	-0.39189D+01	-0.34761D+01	7.00	45	33.80	77	51.40	45	33.30	77	54.10	0.004
618	0.10450D+02	0.10921D+02	7.00	45	32.70	77	48.50	45	33.90	77	51.40	0.004
619	-0.63137D+01	-0.58641D+01	7.00	45	31.40	77	45.70	45	32.70	77	48.50	0.004
620	0.65314D+00	0.85708D+00	7.00	45	30.60	77	44.40	45	31.40	77	45.70	0.007
621	0.26894D+00	0.23140D+00	17.00	45	28.30	76	41.00	45	28.30	76	40.80	0.354
622	-0.40958D+01	-0.34994D+01	16.00	45	32.80	78	33.80	45	33.70	78	37.90	0.015
623	0.39858D+01	0.37087D+01	13.00	45	25.20	75	43.80	45	27.90	75	44.70	0.010
624	0.15943D+02	0.15751D+02	13.00	45	24.90	75	39.70	45	24.90	75	38.80	0.046
625	0.11723D+00	0.11330D+01	13.00	45	24.90	75	38.80	45	23.50	75	42.20	0.010
626	0.26126D+01	0.27613D+01	7.00	45	36.60	74	35.80	45	36.60	74	36.30	0.024
627	-0.65314D+00	-0.65314D+00	7.00	45	36.60	74	36.30	45	36.60	74	36.30	0.153
628	-0.10886D+01	-0.10112D+01	7.00	45	36.60	74	36.30	45	36.50	74	36.50	0.049
629	-0.19594D+01	-0.18409D+01	7.00	45	36.50	74	36.50	45	36.50	74	36.90	0.030
630	0.75329D+01	0.78197D+01	7.00	45	36.50	74	36.90	45	35.60	74	37.30	0.000
631	0.0	0.13529D+00	58.00	45	5.60	75	37.30	45	5.20	75	37.00	1.260
632	-0.84667D+00	-0.72256D+00	36.00	45	23.50	75	42.20	45	23.60	75	42.90	0.444
633	-0.45720D+01	-0.45897D+01	1.00	49	47.80	84	6.50	49	47.60	84	6.30	0.001
634	0.83820D+01	0.81757D+01	4.00	49	41.70	83	41.20	49	41.70	83	39.90	0.003
635	0.16764D+02	0.16799D+02	1.00	47	41.20	83	7.20	47	41.30	83	8.10	0.000
636	-0.24260D+00	-0.17850D+01	49.00	49	45.50	83	58.20	49	43.70	83	52.90	0.100
637	0.32160D+01	0.12637D+01	49.00	49	43.00	83	48.30	49	41.50	83	39.90	0.068
638	0.0	-0.16974D+00	42.00	44	42.60	75	31.00	44	42.80	75	30.50	0.747
639	0.50800D+00	0.37076D+00	42.00	44	42.60	75	30.60	44	42.80	75	30.50	1.406
640	-0.13063D+01	-0.12900D+01	42.00	44	42.60	75	30.60	44	42.60	75	30.80	2.161
641	0.21771D+00	0.37119D+00	42.00	44	13.80	76	29.00	44	13.50	76	29.30	0.817
642	-0.97971D+00	-0.96346D+00	14.00	44	42.60	75	30.60	44	42.60	75	30.80	0.240
643	0.38100D+01	0.36728D+01	14.00	44	42.60	75	30.60	44	42.80	75	30.50	0.156
644	0.87086D+00	0.90336D+00	14.00	44	42.60	75	30.60	44	42.60	75	31.00	0.120
645	-0.18506D+01	-0.18668D+01	14.00	44	42.60	75	31.00	44	42.50	75	30.80	0.240
646	0.47625D+00	0.44349D+00	16.00	45	8.30	76	8.50	45	8.40	76	8.60	0.432
647	-0.18289D+02	-0.17404D+02	2.00	44	22.40	78	1.40	44	21.00	78	7.40	0.000
648	-0.93133D+01	-0.90058D+01	0.00	44	18.50	78	19.20	44	17.50	78	19.70	0.014

649	-0.508000+00	-0.389840+00	9.00	44	17.50	73	19.30	44	17.30	78	20.10	0.023
650	0.103520+01	0.203230+01	53.00	45	30.90	75	32.70	45	30.00	75	36.50	0.171
651	-0.508000+00	-0.508000+00	12.00	45	33.50	75	25.30	45	33.50	75	25.30	0.450
652	-0.165100+01	-0.151810+01	12.00	45	32.70	75	25.50	45	32.60	75	26.00	0.068
653	-0.100150+02	-0.994670+01	7.00	45	35.30	75	24.80	45	35.10	75	25.00	0.034
654	0.326570+01	0.330550+01	7.00	45	35.30	75	24.80	45	35.40	75	25.00	0.049
655	-0.609600-01	0.113130-01	10.00	45	36.00	75	25.20	45	37.00	75	25.80	0.016
656	-0.572910+01	-0.454030+01	54.00	45	36.30	75	10.40	45	35.90	75	14.80	0.150
657	0.242710+01	0.279300+01	54.00	45	36.30	75	9.00	45	36.30	75	10.40	0.510
658	0.451560+00	0.650260+00	54.00	45	36.20	75	8.20	45	36.30	75	9.00	0.879
659	0.423330+00	0.169630+01	54.00	45	36.90	75	3.70	45	36.20	75	8.20	0.155
660	-0.609600+00	-0.622340+00	20.00	45	43.90	76	51.40	45	44.00	76	51.30	0.556
661	-0.152400+01	-0.166210+01	20.00	45	44.00	76	51.30	45	43.60	76	50.70	0.117
662	-0.566060+01	-0.536540+01	7.00	45	31.00	78	11.40	45	30.50	78	13.20	0.006
663	0.134980+02	0.138540+02	7.00	45	30.50	78	9.10	45	31.00	78	11.40	0.005
664	0.117570+02	0.121660+02	7.00	45	29.50	78	6.40	45	30.50	78	9.10	0.034
665	-0.609600+01	-0.554740+01	7.00	45	31.30	78	3.20	45	29.50	78	6.40	0.003
666	0.283030+01	0.317440+01	7.00	45	30.70	78	1.00	45	31.30	78	3.20	0.005
667	-0.108860+01	-0.740200+00	7.00	45	30.30	77	58.80	45	30.70	78	1.00	0.005
668	0.348340+01	0.349770+01	7.00	45	30.20	77	58.70	45	30.30	77	58.80	0.068
669	-0.179290+01	-0.179290+01	17.00	48	36.70	93	24.10	48	36.70	93	24.10	0.903
670	-0.606550+01	-0.346320+01	50.00	48	43.50	94	32.00	48	43.40	94	28.10	0.157
671	0.110840+01	0.113210+01	22.00	48	26.10	89	13.20	48	26.10	89	13.40	0.593
672	-0.277090+00	-0.130920+00	22.00	48	23.10	89	14.70	48	22.90	89	14.70	0.408
673	0.159570+02	0.896440+01	17.00	49	2.10	95	38.50	49	2.10	95	43.30	0.015
674	-0.457200+01	-0.458970+01	1.00	49	47.80	84	6.50	49	47.80	84	6.30	0.001
675	0.121920+02	0.120910+02	1.00	48	6.60	75	11.80	48	6.60	75	11.70	0.002
676	0.105230+01	0.314150+01	42.00	46	46.10	72	30.20	46	42.30	72	35.10	0.063
677	-0.449940+00	0.229120+00	42.00	46	42.80	72	35.10	46	38.40	72	38.80	0.059
678	-0.929900+00	-0.169420+01	59.00	48	39.50	90	29.50	48	40.00	90	22.30	0.118
679	0.264160+01	0.264160+01	3.00	49	0.80	88	15.60	49	0.80	88	15.60	0.028
680	0.568960+01	0.551910+01	3.00	49	0.80	88	15.60	49	1.20	88	15.00	0.003
681	0.237250+01	0.221980+01	37.00	49	17.00	88	6.60	49	18.50	88	6.60	0.154
682	-0.197710+00	-0.384160+00	37.00	49	18.50	88	6.60	49	22.20	88	7.70	0.061
683	0.313040+00	0.636530+00	37.00	49	40.20	87	29.00	49	41.10	87	30.40	0.175
684	0.219130+01	0.224090+01	37.00	49	41.10	87	30.40	49	41.20	87	32.20	0.186
685	0.261260+01	0.191520+01	14.00	50	10.70	86	42.80	50	10.00	86	40.40	0.018
686	0.200120+01	-0.250060+01	49.50	48	24.10	80	18.70	48	32.00	80	28.40	0.040
687	0.213050+01	-0.132120+01	49.50	48	14.10	80	15.00	48	17.50	80	14.00	0.119
688	0.347660+01	0.310570+01	32.00	49	45.00	81	31.90	49	47.20	81	32.50	0.077
689	-0.371480+01	-0.297070+01	32.00	49	47.20	81	32.50	49	47.80	81	33.50	0.189
690	-0.184780+01	-0.834740+00	32.00	49	47.80	81	33.50	49	48.50	81	34.80	0.152
691	-0.108860+01	-0.132950+01	7.00	49	3.70	81	1.50	49	3.70	81	1.10	0.030
692	0.258150+01	0.254670+01	49.00	48	28.50	80	21.80	48	28.50	80	21.70	5.883
693	0.246300-01	0.854530+00	49.50	48	33.50	80	32.40	48	29.50	80	23.90	0.058
694	0.457200+01	0.432220+01	1.00	48	5.30	82	6.20	48	5.20	82	3.40	0.000
695	-0.195940+01	-0.209800+01	7.00	48	5.90	80	3.60	48	6.20	80	4.30	0.015
696	-0.740230+01	-0.730660+01	7.00	48	6.20	80	4.30	48	6.50	80	6.20	0.006
697	-0.338330+01	-0.228780+01	60.00	45	32.50	77	27.50	45	30.80	77	33.80	0.130
698	0.586150+00	0.644770+00	13.00	46	19.00	79	28.00	46	18.50	79	27.90	0.056
699	0.410310+01	0.411880+01	13.00	46	19.00	79	28.00	46	18.50	79	27.30	0.041
700	0.293080+01	0.235660+01	13.00	46	16.10	79	11.60	46	16.30	79	4.70	0.006
701	0.944880+01	0.982030+01	13.00	46	16.10	79	0.0	46	16.30	79	4.70	0.009
702	-0.586150+00	-0.457290+00	13.00	46	16.90	78	53.30	46	17.10	78	55.00	0.024
703	-0.351690+00	-0.844960+00	13.00	46	16.90	78	53.30	46	17.50	78	47.90	0.008
704	0.422030+00	0.343460+00	13.00	46	18.50	78	42.70	46	19.20	78	42.20	0.037
705	0.277090+01	0.385460+01	22.00	45	3.00	75	41.30	45	1.50	75	43.90	0.035
706	0.856210+01	0.876370+01	22.00	45	1.50	75	43.90	45	0.30	75	41.20	0.037
707	-0.187040+01	-0.379970+00	22.00	45	0.30	75	41.20	44	58.00	75	47.10	0.019
708	0.256310+01	0.262520+01	22.00	44	58.90	75	47.10	44	58.20	75	47.20	0.672
709	0.943430+00	0.613410+00	21.00	45	15.40	75	21.40	45	15.00	75	20.70	0.107

710	-0.52977D+01	-0.57157D+01	21.00	45 15.90	75 20.70	45 15.90	75 18.60	0.051
711	0.22860D+01	0.27688D+01	16.00	45 14.30	75 2.60	45 14.00	75 4.30	0.075
712	-0.11144D+02	-0.10407D+02	16.00	45 7.50	75 6.00	45 6.90	75 10.40	0.025
713	0.44768D+01	0.53436D+01	16.00	45 20.00	74 53.40	45 18.90	74 55.00	0.027
714	-0.99881D+01	-0.10027D+02	52.00	45 26.10	76 21.30	45 26.10	76 21.10	3.313
715	-0.93902D+01	-0.82099D+01	52.00	45 26.10	76 21.10	45 26.60	76 27.50	0.103
716	-0.46072D+01	-0.37021D+01	52.00	45 26.60	76 27.50	45 26.70	76 22.30	0.172
717	-0.26709D+01	-0.24602D+01	59.00	44 43.00	76 53.50	44 43.00	76 55.80	0.371
718	0.45978D+00	0.95060D+00	59.00	44 43.00	76 55.80	44 42.50	76 59.00	0.260
719	-0.19011D+01	-0.28034D+01	59.00	44 46.30	76 41.50	44 48.50	76 41.50	0.267
720	-0.69226D+00	0.68110D-01	59.00	44 52.30	76 22.80	44 51.30	76 25.80	0.256
721	0.12967D+01	0.29486D+01	59.00	44 54.00	76 14.80	44 52.30	76 22.50	0.102
722	-0.10973D+02	-0.11715D+02	3.00	49 5.90	90 42.50	49 7.10	90 43.20	0.001
723	0.50800D+01	0.39260D+01	3.00	48 53.90	90 21.60	49 0.70	90 25.40	0.000
724	-0.68441D+01	-0.68804D+01	44.00	44 10.60	81 38.60	44 10.60	81 38.30	0.989
725	0.37279D+01	0.38234D+01	12.00	43 7.10	81 59.10	43 9.30	81 59.10	0.913
726	0.14062D+01	0.13822D+01	44.00	44 44.50	81 8.30	44 44.60	81 8.20	1.681
727	-0.13716D+01	-0.11951D+01	44.00	44 44.60	81 8.20	44 49.00	81 12.70	0.033
728	0.19396D+00	0.90668D-01	44.00	44 36.50	80 35.90	44 36.50	80 35.20	0.424
729	-0.73152D+00	-0.11854D+01	10.00	44 43.70	79 43.30	44 44.30	79 40.70	0.009
730	-0.71628D+01	-0.73159D+01	8.00	42 52.50	79 5.60	42 53.00	79 3.20	0.006
731	0.19050D+00	0.12997D+00	8.00	42 53.10	79 2.50	42 53.10	79 0.70	0.009
732	0.86360D+01	0.31910D+01	3.00	48 49.30	99 55.10	48 50.00	99 56.10	0.002
733	-0.17392D+01	-0.97664D+00	34.00	48 25.60	89 13.20	48 24.60	89 13.50	0.191
734	0.32143D+01	0.58831D+00	11.00	46 20.80	83 55.10	46 31.00	84 5.60	0.002
735	0.13106D+02	0.13311D+02	10.00	46 31.20	84 28.00	46 31.60	84 32.50	0.005
736	0.20782D+02	0.19272D+02	11.00	46 20.20	84 0.80	46 25.60	84 4.10	0.003
737	-0.96391D+00	0.74303D+00	46.00	46 5.10	78 17.70	46 4.80	78 20.70	0.072
738	0.25265D+01	0.28900D+01	41.50	46 10.90	77 38.50	46 11.40	77 41.00	0.101
739	-0.19050D+01	-0.19005D+01	4.00	43 17.40	79 4.30	47 17.80	79 4.80	0.008
740	0.10278D+01	0.16401D+01	43.00	43 44.50	81 42.50	47 52.70	81 41.20	0.074
741	0.45720D+00	0.48511D+00	2.00	43 55.30	80 53.40	43 54.90	80 53.40	0.002
742	-0.22831D+02	-0.23348D+02	31.00	44 25.50	79 7.60	44 29.20	79 9.00	0.026
743	0.19191D+01	0.25920D+00	54.00	44 14.90	78 44.70	44 21.10	78 43.50	0.079
744	0.19643D+02	0.19763D+02	9.00	46 28.70	80 53.40	46 29.30	80 59.60	0.003
745	0.11904D+02	0.11900D+02	37.00	47 23.80	79 41.40	47 23.80	79 41.30	3.355
746	-0.18757D+01	-0.12544D+01	13.00	45 32.30	75 48.50	45 34.70	75 52.10	0.003
747	0.14478D+02	0.13922D+02	4.00	45 15.90	75 18.50	45 16.40	75 16.70	0.002
748	-0.70031D+01	-0.69956D+01	42.00	44 13.50	76 29.00	44 13.50	76 29.30	1.441
749	0.46892D+01	0.48481D+01	26.00	48 22.90	89 14.70	48 22.70	89 14.60	0.539
750	-0.35098D+01	-0.34055D+01	49.50	48 28.50	80 21.50	48 28.50	80 21.60	2.001
751	0.36342D+01	0.41221D+01	13.00	46 17.10	78 55.00	46 16.10	79 0.0	0.008
752	-0.14732D+02	-0.14760D+02	3.00	42 51.30	80 29.50	42 51.30	80 31.50	0.001
753	-0.45720D+01	-0.44723D+01	8.00	46 27.40	80 23.70	46 27.60	80 26.70	0.005
754	0.10758D+01	0.76389D+00	17.00	46 5.10	80 39.00	46 7.10	80 40.40	0.022
755	0.44824D+01	0.42201D+01	34.00	46 33.90	81 8.40	46 35.20	81 11.90	0.071
756	-0.80682D+01	-0.82604D+01	34.00	46 34.50	81 16.80	46 36.10	81 24.50	0.035
757	0.10160D+01	0.72951D+00	24.00	46 36.10	81 24.50	46 37.20	81 26.40	0.057
758	0.76200D+01	0.60768D+01	24.00	46 37.20	81 26.40	46 42.50	81 33.20	0.014
759	-0.15818D+01	-0.22937D+01	58.00	48 1.00	84 31.30	48 4.00	84 33.00	0.176
760	-0.48006D+01	-0.46961D+01	12.00	42 6.30	83 6.60	42 8.10	83 6.90	0.013
761	-0.92015D+00	-0.15285D+01	53.00	48 57.30	87 57.50	48 59.60	88 1.50	0.132
762	-0.39858D+01	-0.39690D+01	13.00	43 39.00	81 42.40	43 40.50	81 42.40	0.019
763	0.70338D-01	0.70202D-01	13.00	43 36.40	81 42.40	43 39.00	81 42.40	0.011
764	-0.49161D-02	-0.25449D+00	62.00	44 25.80	80 50.60	44 23.40	80 47.40	0.199
765	-0.93726D+01	-0.93501D+01	4.00	45 20.40	80 0.0	45 20.90	80 0.50	0.004
766	0.18593D+01	0.20281D+01	50.00	48 28.80	81 19.50	48 28.50	81 19.50	1.405
767	-0.13252D+01	-0.13078D+01	11.50	46 30.50	84 19.70	46 30.40	84 19.50	0.131
768	-0.38100D+01	-0.42285D+01	54.00	46 31.30	84 20.60	46 32.90	84 21.20	0.277
769	0.12954D+02	0.12556D+02	8.00	47 27.10	79 37.90	47 27.30	79 38.40	0.027
770	-0.36407D+01	-0.59286D+01	36.00	47 15.50	79 45.00	47 20.30	79 48.00	0.042

771	0.80433D+00	-0.12601D+01	36.00	47	20.30	78	48.00	47	22.00	79	41.40	0.000
772	0.12192D+02	0.11955D+02	2.00	43	36.30	78	44.30	43	37.00	79	43.00	0.000
773	0.14369D+01	0.14685D+01	42.00	43	54.60	80	52.50	43	54.00	80	52.00	0.074
774	-0.40234D+01	-0.39590D+01	5.00	42	59.10	82	50.70	42	59.20	81	22.50	0.003
775	-0.22738D+02	-0.22689D+02	5.00	42	59.00	82	19.40	42	59.10	81	20.70	0.001
776	0.21336D+01	0.21766D+01	5.00	42	59.00	82	17.40	42	59.00	81	18.70	0.000
777	-0.60960D+00	-0.11457D+01	3.00	42	7.40	80	45.40	42	8.00	80	48.20	0.001
778	0.22801D+01	0.20478D+01	22.00	44	45.00	79	53.20	44	44.00	79	51.50	0.024
779	0.39757D+01	0.40469D+01	11.50	45	30.50	84	19.70	45	30.70	84	21.00	0.017
780	-0.43088D+01	-0.43382D+01	44.00	43	55.00	81	42.10	43	57.00	81	40.20	0.113
781	0.32539D+01	0.28797D+01	37.00	46	19.50	79	27.30	46	20.90	79	26.50	0.044
782	-0.86497D+00	-0.81930D+00	37.00	45	19.50	79	28.30	45	19.00	79	28.00	0.427
783	-0.26194D+02	-0.28217D+02	4.00	43	17.10	79	43.00	43	17.90	79	47.80	0.010
784	0.25537D+01	0.15569D+01	37.00	46	51.00	79	43.80	46	58.10	79	44.40	0.103
785	-0.21336D+01	-0.20557D+01	12.00	42	3.70	83	6.80	42	0.10	83	6.80	0.017
786	-0.16525D+01	-0.16994D+01	41.50	45	11.50	77	41.00	45	10.40	77	41.50	0.152
787	0.25116D+02	0.25160D+02	5.00	42	58.00	82	16.30	42	59.00	81	17.40	0.006
788	0.68278D+01	0.68504D+01	5.00	42	59.00	82	18.70	42	59.00	82	19.40	0.000
789	-0.26883D+02	-0.26851D+02	5.00	42	59.20	82	22.50	42	59.30	82	23.70	0.008
790	0.12192D+02	0.12190D+02	8.50	44	8.50	81	18.80	44	4.50	81	13.50	0.017
791	0.91440D+01	0.98846D+01	2.00	43	37.00	79	43.00	43	37.30	79	41.00	0.000
792	-0.30480D+01	-0.30086D+01	3.00	43	25.80	80	31.20	43	25.50	80	31.30	0.005
793	-0.17542D+01	-0.26956D+01	49.00	49	43.70	83	52.00	49	43.00	83	48.30	0.125
794	0.62900D+01	0.53094D+01	11.00	46	29.50	84	4.10	46	32.50	84	8.90	0.004
795	0.83127D+00	0.80382D+00	11.00	46	32.50	84	8.90	46	32.00	84	9.90	0.027
796	-0.77585D+00	0.15496D+00	11.00	46	32.80	84	9.90	46	31.40	84	15.00	0.004
797	0.58297D+01	0.63096D+01	11.00	46	31.20	84	17.50	46	30.40	84	19.70	0.014
798	0.34821D+01	0.42125D+01	11.00	46	11.30	82	32.70	46	11.00	81	11.70	0.051
799	0.14344D+01	0.76377D+00	17.00	48	43.30	94	33.70	48	45.20	94	35.20	0.047
800	-0.16316D+02	-0.16845D+02	17.00	48	43.50	94	32.00	48	43.70	94	33.70	0.041
801	0.14181D+02	0.16792D+02	37.00	49	22.40	84	16.00	49	41.10	84	17.20	0.017
802	0.16348D+01	0.17624D+01	11.00	46	31.40	84	16.00	46	31.00	84	17.50	0.031
803	-0.20761D+01	-0.60691D+00	53.00	48	59.30	88	15.70	48	56.00	88	18.70	0.122
804	0.81280D+00	0.46017D+00	3.00	49	52.80	93	21.10	49	54.10	93	21.60	0.001
805	0.41655D+01	0.37739D+01	3.00	49	47.80	92	51.00	49	48.60	92	51.80	0.002
806	-0.43688D+01	-0.46584D+01	3.00	49	24.90	91	39.80	49	25.10	91	40.60	0.002
807	-0.20320D+00	-0.11769D+01	3.00	49	17.30	91	18.30	49	18.30	91	22.10	0.001
808	0.81280D+00	0.18691D+00	3.00	49	14.50	91	2.40	49	14.80	91	8.00	0.000
809	0.10160D+00	0.10160D+00	3.00	47	46.30	83	22.50	47	46.30	83	22.50	0.000
810	-0.29261D+02	-0.29306D+02	1.00	47	28.30	80	30.00	47	29.10	80	31.50	0.000
811	0.0	0.65035D+01	4.00	43	28.00	80	27.30	43	27.50	80	28.00	0.005
812	-0.15951D+02	-0.15891D+02	3.00	43	49.80	80	31.30	43	49.00	80	32.00	0.003
813	-0.20726D+02	-0.20852D+02	1.00	44	0.80	74	40.80	44	1.30	79	40.30	0.000
814	-0.95903D+01	-0.12213D+02	28.00	44	25.30	78	16.40	44	33.50	78	12.50	0.010
815	-0.29947D+02	-0.30015D+02	8.00	44	22.80	77	53.30	44	23.00	77	53.80	0.054
816	-0.51054D+01	-0.51205D+01	12.00	42	2.20	82	44.50	42	2.20	82	45.30	0.044
817	-0.18286D+02	-0.18287D+02	8.00	42	52.40	79	15.10	42	52.40	79	15.20	0.157
818	-0.60960D+01	-0.66109D+01	10.00	48	32.30	89	41.20	48	32.40	89	36.60	0.205
819	0.29905D+01	0.27557D+01	53.00	49	0.20	89	12.50	49	1.20	88	15.00	0.238
820	-0.92015D+00	-0.15285D+01	53.00	48	57.30	87	57.50	48	59.60	88	1.50	0.132
821	0.18921D+01	0.17201D+01	53.00	48	54.30	87	43.10	48	55.30	87	45.40	0.191
822	0.36678D+01	0.47781D+01	60.00	48	44.70	91	68.50	48	45.00	91	35.00	0.032
823	-0.19568D+02	-0.19618D+02	5.00	49	24.90	91	39.80	49	24.90	91	40.00	0.031
824	0.28651D+02	0.28899D+02	1.00	46	31.40	84	15.80	46	31.00	84	17.50	0.000
825	-0.74645D+01	-0.15576D+00	49.00	46	26.20	80	16.50	46	25.80	80	13.20	0.176
826	-0.52730D+02	-0.53194D+02	3.00	48	56.40	90	9.80	48	57.20	90	15.20	0.000
827	-0.25908D+02	-0.25472D+02	3.00	49	50.90	93	21.80	49	51.00	93	21.50	0.000
828	0.25400D+01	0.21741D+01	3.00	47	45.30	83	22.30	47	46.30	83	22.50	0.001
829	-0.27635D+02	-0.28105D+02	3.00	49	15.40	91	13.30	49	15.00	91	15.50	0.001
830	0.23774D+01	0.51198D+00	60.00	46	36.30	93	21.50	46	41.00	93	1.50	0.042
831	0.62007D+01	0.44659D+01	49.50	43	32.00	80	27.90	43	42.00	80	47.20	0.025

832	0.10160D+00	-0.11183D+00	3.00	47	44.80	83	23.30	47	45.30	83	22.80	0.003
833	-0.15240D+01	-0.14402D+01	13.00	42	34.00	82	22.80	42	35.10	82	22.80	0.026
834	0.17374D+02	0.42379D+00	100.00	43	38.40	79	22.80	44	13.10	76	31.10	0.137
835	0.11582D+02	-0.32238D+00	100.00	43	38.40	79	22.80	44	0.0	76	13.00	0.139
836	-0.57912D+01	-0.74617D+00	100.00	44	13.10	76	31.10	44	0.0	76	13.00	0.289
837	-0.94480D+01	-0.81002D+00	100.00	43	25.00	76	35.00	43	38.40	79	22.80	0.138
838	0.79248D+01	-0.38623D+00	100.00	43	25.00	76	35.00	44	13.10	76	31.10	0.279
839	0.21336D+01	-0.11324D+01	100.00	43	25.00	76	35.00	44	0.0	76	13.00	0.311
840	-0.60960D+01	-0.58621D+01	100.00	42	39.50	81	12.80	42	52.40	79	15.20	0.052
841	0.30480D+00	-0.57092D+00	100.00	42	39.50	81	12.80	42	55.00	78	52.00	0.052
842	-0.54864D+01	-0.25783D+01	100.00	42	39.50	81	12.80	41	30.00	81	38.00	0.047
843	-0.64006D+01	-0.52912D+01	100.00	42	55.00	78	52.00	42	52.40	79	15.20	0.131
844	-0.57912D+01	-0.20074D+01	100.00	42	55.00	78	52.00	41	30.00	81	38.00	0.079
845	-0.60960D+00	-0.32837D+01	100.00	41	30.00	81	38.00	42	52.40	79	15.20	0.080
846	-0.20726D+02	-0.56600D+01	100.00	46	15.20	83	33.10	43	44.80	81	43.70	0.075
847	0.0	0.64954D+00	100.00	46	15.20	83	33.10	44	30.30	80	13.00	0.133
848	-0.19202D+02	0.77599D+00	100.00	46	15.20	83	33.10	43	55.00	82	45.00	0.073
849	-0.11582D+02	-0.23703D+01	100.00	46	15.20	83	33.10	45	47.00	84	47.00	0.076
850	0.20422D+02	0.60048D+01	100.00	43	44.80	81	43.70	44	30.30	80	13.00	0.040
851	0.15240D+01	0.64360D+01	100.00	43	44.80	81	43.70	43	55.00	82	45.00	0.077
852	0.94488D+01	0.35946D+01	100.00	43	44.80	81	43.70	45	47.00	84	47.00	0.047
853	-0.19202D+02	0.12646D+00	100.00	44	30.30	80	13.00	43	55.00	82	45.00	0.301
854	-0.11278D+02	-0.27150D+01	100.00	44	30.30	80	13.00	45	47.00	84	47.00	0.075
855	-0.76200D+01	0.31463D+01	100.00	45	47.00	84	47.00	43	55.00	82	45.00	0.074
856	0.57912D+01	-0.78108D+00	100.00	46	29.00	84	40.00	48	24.60	89	13.00	0.073
857	0.28956D+02	0.72301D+00	100.00	46	29.00	84	40.00	47	57.70	84	54.00	0.131
858	-0.12192D+02	-0.88678D+00	100.00	46	29.00	84	40.00	46	32.00	87	27.00	0.289
859	-0.23470D+02	0.35732D+00	100.00	46	29.00	84	40.00	46	45.00	82	6.00	0.074
860	-0.23165D+02	-0.15041D+01	100.00	47	57.70	84	54.00	48	24.60	89	13.00	0.046
861	-0.40843D+02	-0.13050D+01	100.00	47	57.70	84	54.00	46	32.00	87	27.00	0.128
862	-0.52121D+02	-0.60839D+01	100.00	47	57.70	84	54.00	46	45.00	82	6.00	0.046
863	-0.17678D+02	0.19910D+00	100.00	48	24.60	89	13.00	46	32.00	87	27.00	0.074
864	-0.28956D+02	0.14432D+01	100.00	48	24.60	89	13.00	46	45.00	92	6.00	0.072
865	0.11278D+02	-0.12441D+01	100.00	46	45.00	92	6.00	46	32.00	87	27.00	0.133
866	0.23652D+02	0.26802D+02	100.00	42	1.60	82	44.10	42	52.40	79	15.20	0.001
867	0.79248D+00	-0.48768D+01	100.00	43	14.20	79	13.20	43	38.40	79	22.80	0.017
868	0.21549D+02	-0.10697D+01	100.00	43	14.20	79	13.20	44	13.10	76	31.10	0.009
869	0.30480D+00	-0.57349D+01	100.00	46	15.20	83	33.10	45	20.30	80	2.20	0.005
870	-0.20726D+01	0.46166D+01	100.00	45	20.30	80	2.20	44	30.30	80	13.00	0.005
871	-0.79553D+01	0.13151D+02	100.00	45	20.30	80	2.20	43	44.80	81	43.70	0.001
872	0.13106D+02	0.16022D+02	100.00	42	1.60	82	44.10	42	39.50	81	12.80	0.001