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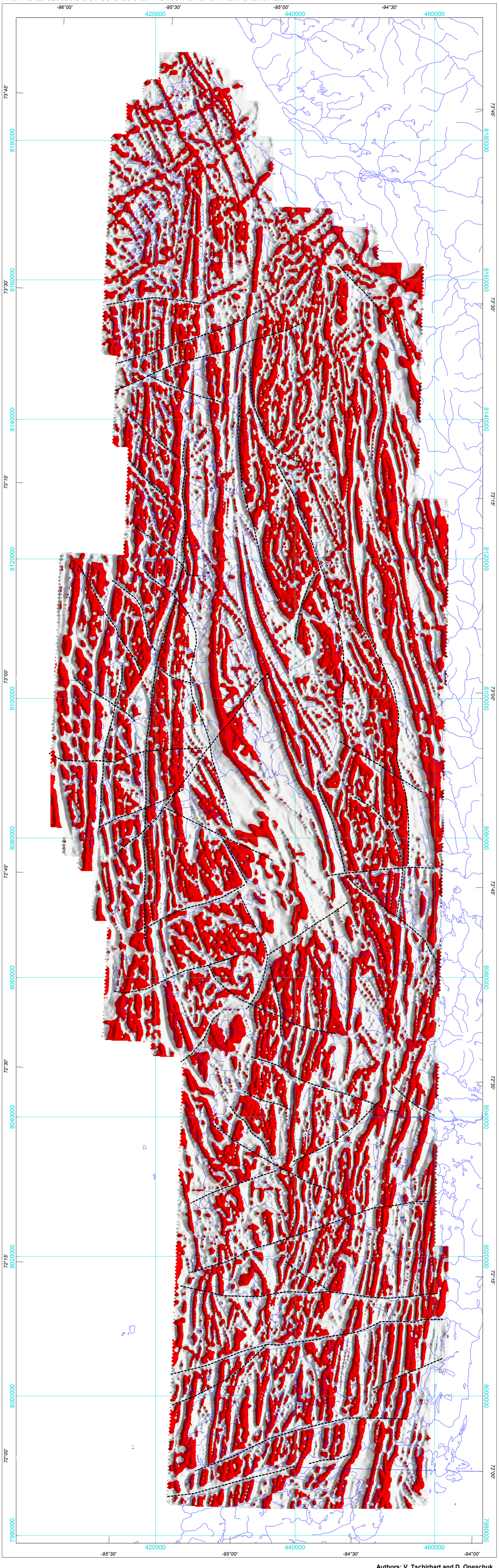
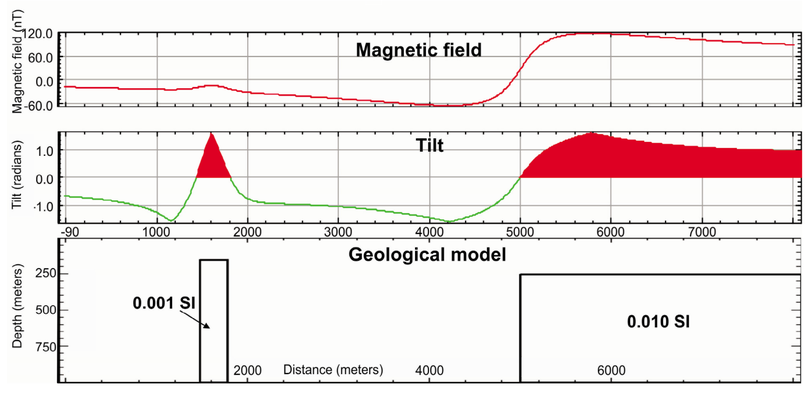
GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

INTERPRETED GEOLOGICAL STRUCTURES OVER THE POSTIVE TILT OF THE MAGNETIC FIELD





Top figure: Magnetic field (top panel), tilt (middle panel) and geological model (bottom panel). Positive tilt filled in red. Geological bodies represent a weakly magnetic dike (left) and highly magnetic contact (right) with the tilt equalizing the respective anomalies. Magnetic susceptibility is labelled and bodies are magnetized in a vertical field.

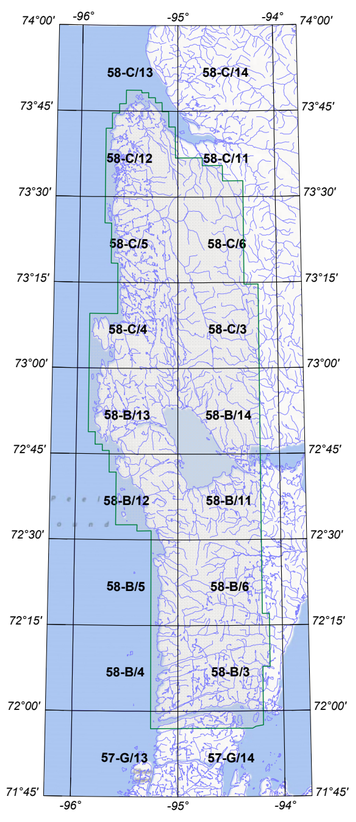
The tilt angle (Miller and Singh, 1994) is the arctangent of the ratio of the vertical derivative of the magnetic field over the magnitude of the horizontal derivative of the magnetic field. The amplitude is restricted to –Π/2 to Π/2, is generally positive over the source, negative outside of the source, and crosses zero at or near the source edge. Tilt effectively equalizes amplitudes of the magnetic field, so weak and strong anomalies have a similar appearance.

$$\text{Tilt} = \tan^{-1}\{(df/dz)/[(df/dx)^2+(df/dy)^2]^{1/2}\}$$

Left map: Tilt map of the magnetic field displaying positive tilt (magnetic source bodies) in red. Interpreted geological structures were derived from the tilt map and digital elevation data, and plotted as black dashed lines.

Miller, H.G., and Singh, V., 1994, Potential field tilt - a new concept for location of potential field sources. Journal of Applied Geophysics, 32, 213-217.

This publication is available for free download through GEOSCAN (http://geoscan.nrcan.gc.ca/). Corresponding digital profile and gridded data as well as similar data for adjacent airborne geophysical surveys are available from Natural Resources Canada's Geoscience Data Repository for Aeromagnetic data at http://gdr.agg.nrcan.gc.ca/index_e.html. The same products are also available, for a fee, from the Geophysical Data Centre, Geological Survey of Canada, 615 Booth Street, Ottawa, Ontario K1A 0E9. Telephone: (613) 995-5326, email: nfogdc@agg.nrcan.gc.ca.

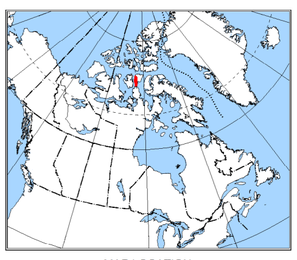


NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND GEOPHYSICAL MAP INDEX

PLANIMETRIC SYMBOLS

Drainage .....

Interpreted Geological Structure .....



MAP LOCATION

GEOLOGICAL SURVEY OF CANADA OPEN FILE 7805

AEROMAGNETIC INTERPRETATION PRODUCTS, SOMERSET ISLAND, NUNAVUT

Parts of NTS 58-B/3, 4, 5, 6, 11, 12, 13, 14, parts of NTS 58-C/3, 4, 5, 6, 11, 12, 13, and parts of NTS 57-G/13, 14

INTERPRETED GEOLOGICAL STRUCTURES OVER THE POSTIVE TILT OF THE MAGNETIC FIELD

Scale 1:250 000

5000 0 5000 10000 15000

(metres)

WGS 84 / UTM zone 15N

Universal Transverse Mercator Projection
North American Datum 1983

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Digital topographic data from Natural Resources Canada

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FEUILLET 3 DE 4

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Canada

GEM-2

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Authors: V. Tschirhart and D. Oneschuk

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