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Publications in this series have not been edited; they are released as submitted by the author.

INTRODUCTION

The M6.3 Ruisui (Taiwan) earthquake occurred at 12:02:08 (UTC) on 31 October 2013 with epicenter located 23.590°N 121.437°E with a focal depth of 10 km. [Earthquake.usgs.gov].

Differential interferograms presented here were calculated from RADARSAT-2 Synthetic Aperture Radar (SAR) data using Differential Interferometric Synthetic Aperture Radar (DInSAR) methodology. The processing was performed with GAMMA software [Wegmüller and Werner, 1997] and consisted of the following steps: slave to master image coregistration and resampling; interferogram calculation and removal of the topographic phase reconstructed from the 30 m ASTER DEM [Gdex.cr.usgs.gov], orbital correction, adaptive filtering [Goldstein and Werner, 1998]; phase unwrapping [Costantini, 1998]; and geocoding.

Table 1: SAR data used in the study: beam mode, time span in format YYYYMMDD, perpendicular baseline, azimuth (Θ) and incidence angle (Φ).

Beam	Time span	Side looking	Perp. Base. [m]	Θ [°]	Φ [°]
Multi-Look-Fine 3 (MF3)	20130622–20131113	right	39	349	43
Multi-Look Fine 3 (MF3)	20130716–20131113	right	-54	349	43
Multi-Look Fine 6 (MF6)	20130627–20131118	right	119	-170	48
Multi-Look Fine 6 (MF6)	20130721–20131118	right	82	-170	48

Differential interferograms were calculated from the Multi-Look Fine 3 (MF3) and Multi-Look Fine 6 (MF6) beam modes (Tab. 1, Figs 1, 3, 5, 7). Final products, unwrapped geocoded interferograms (Figs 2, 4, 6, 8), are provided in GMT grid format and measured in centimeters (.grd files). By definition, motion away from the satellite in the line-of-sight (LOS lengthening) is negative and motion towards the satellite (LOS shortening) is positive. Supplementary data include Google Earth kml files of the unwrapped interferograms (re-wrapped for visualization) similar to Figs 1, 3, 5, 7 and also SAR look-vector elevation angle (lv_theta) and SAR look-vector orientation angle (lv_phi) files measured in radians. The elevation angle ranges from pi/2=UP to -pi/2=DOWN and the orientation vector ranges from 0=EAST to pi/2=NORTH. These values can be used for calculating a LOS unit vector pointing from the ground to the satellite [Samsonov and d'Oreye, 2012] using the following equations:

S_north = cos(lv_theta)*sin(lv_phi)

S_east = cos(lv_theta)*cos(lv_phi)

S_up = sin(lv_theta)

The interferograms provided here can be used for geophysical modeling and inversion.

References:

Costantini, M., 1998. A novel phase unwrapping method based on network programming IEEE Transactions on Geoscience and Remote Sensing, 36, 813–821

Earthquake.usgs.gov. http://earthquake.usgs.gov/earthquakes/dyfi/events/us/c000ksdy/us/index.html. Access 27 Feb. 2015

Goldstein, R. and Werner, C., 1998. Radar interferogram filtering for geophysical applications, Geophysical Research Letters, 25, 4035–4038, 1998

Samsonov, S. and d'Oreye, N., 2012. Multidimensional time series analysis of ground deformation from multiple InSAR data sets applied to Virunga Volcanic Province, Geophysical Journal International, 191, 1095–1108

Gdex.cr.usgs.gov. http://gdex.cr.usgs.gov/gdex/. Access 27 Feb. 2015

Wegmüller, U. and Werner, C., 1997. Gamma SAR processor and interferometry software,

in: The 3rd ERS Symposium on Space at the Service of our Environment, Florence, Italy, 1997, 1687–1692

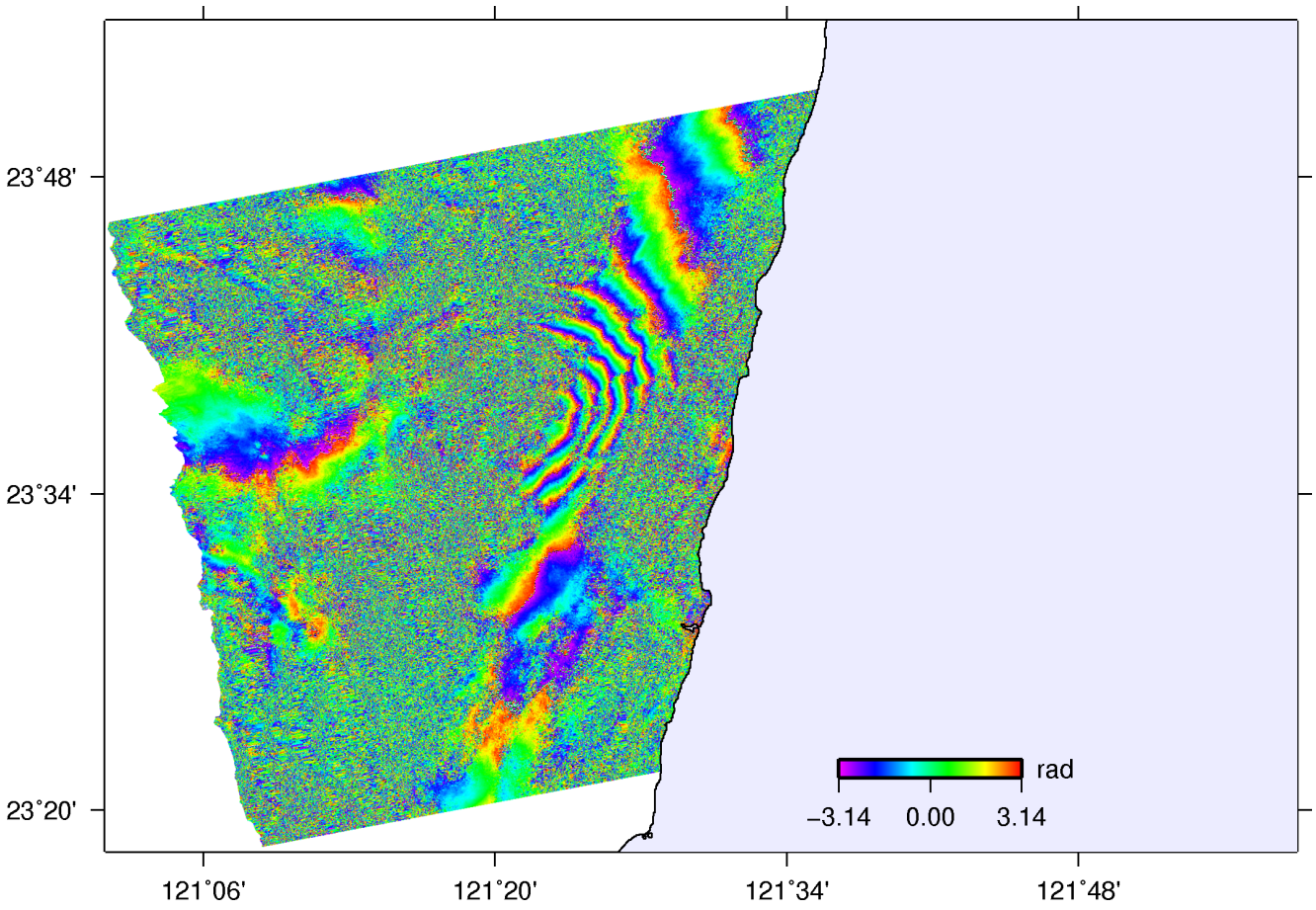

Figure 1: Filtered wrapped differential interferogram calculated from two RADARSAT-2 MF3 images acquired on 20130622–20131113 from ascending orbit, right looking geometry. Perpendicular baseline is 39 m.

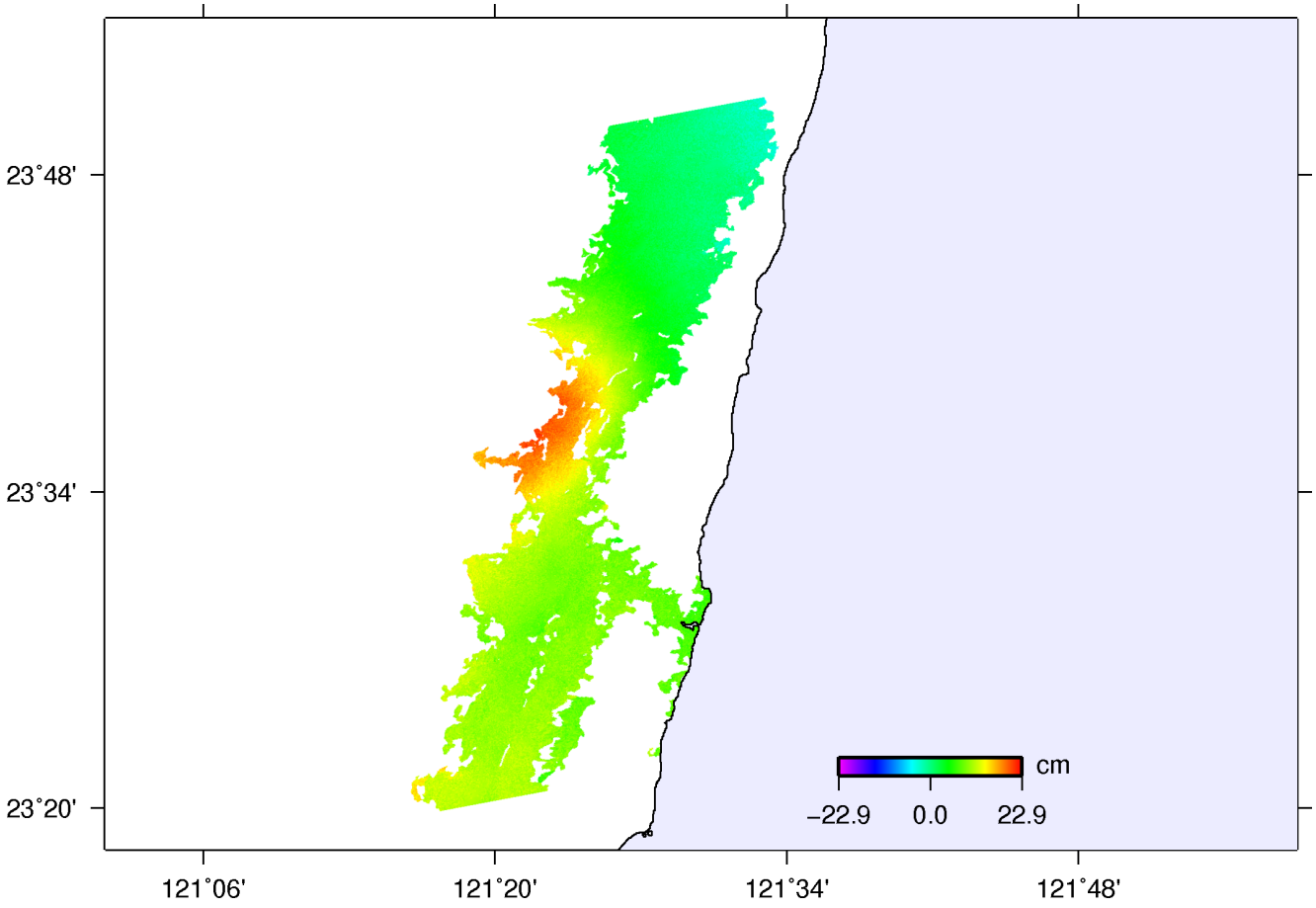

Figure 2: Unwrapped differential interferogram calculated from two RADARSAT-2 MF3 images acquired on 20130622–20131113 from ascending orbit, right looking geometry. Perpendicular baseline is 39 m. This data is provided in GMT grid file format.

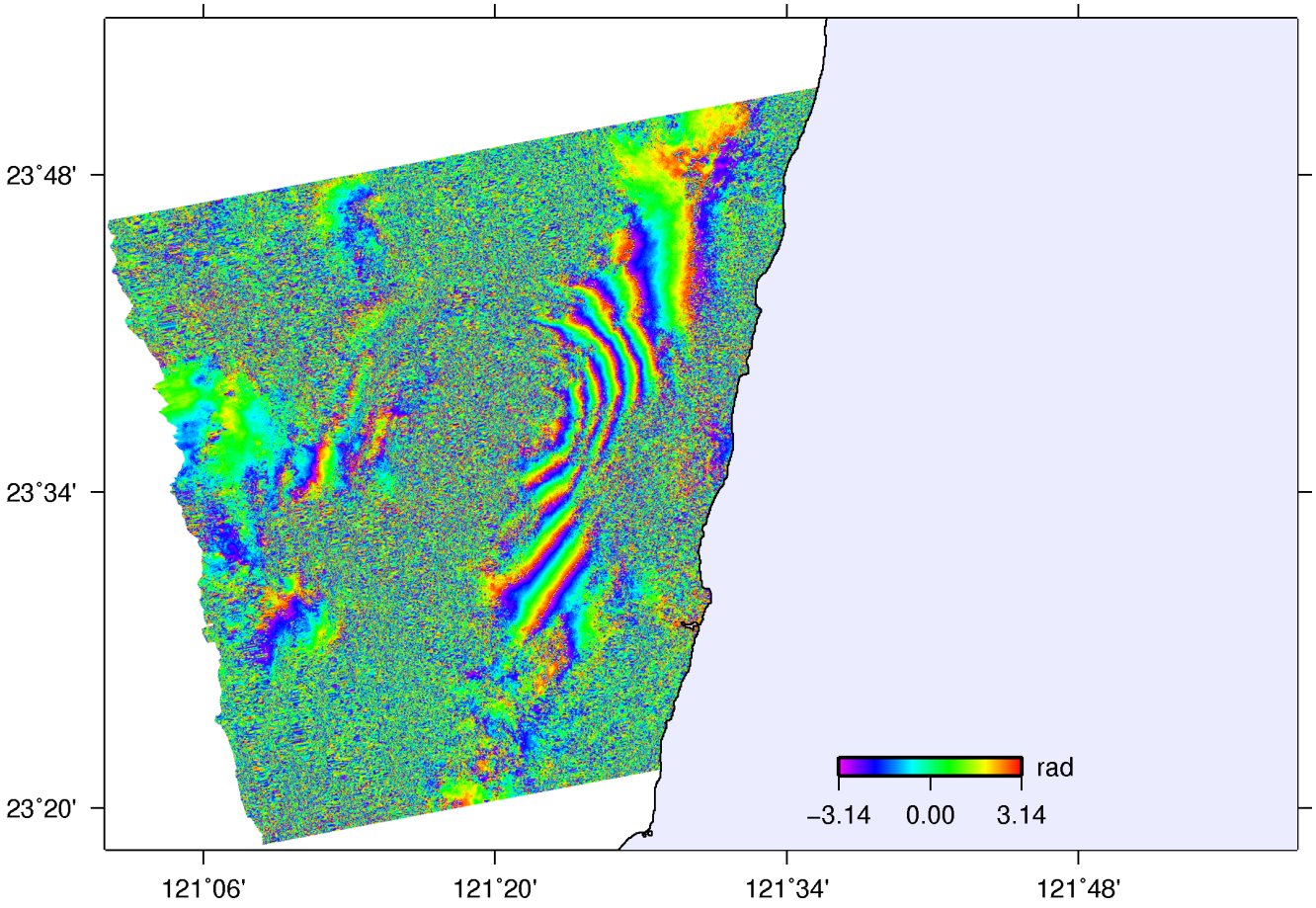

Figure 3: Filtered wrapped differential interferogram calculated from two RADARSAT-2 MF3 images acquired on 20130716–20131113 from ascending orbit, right looking geometry. Perpendicular baseline is -54 m.

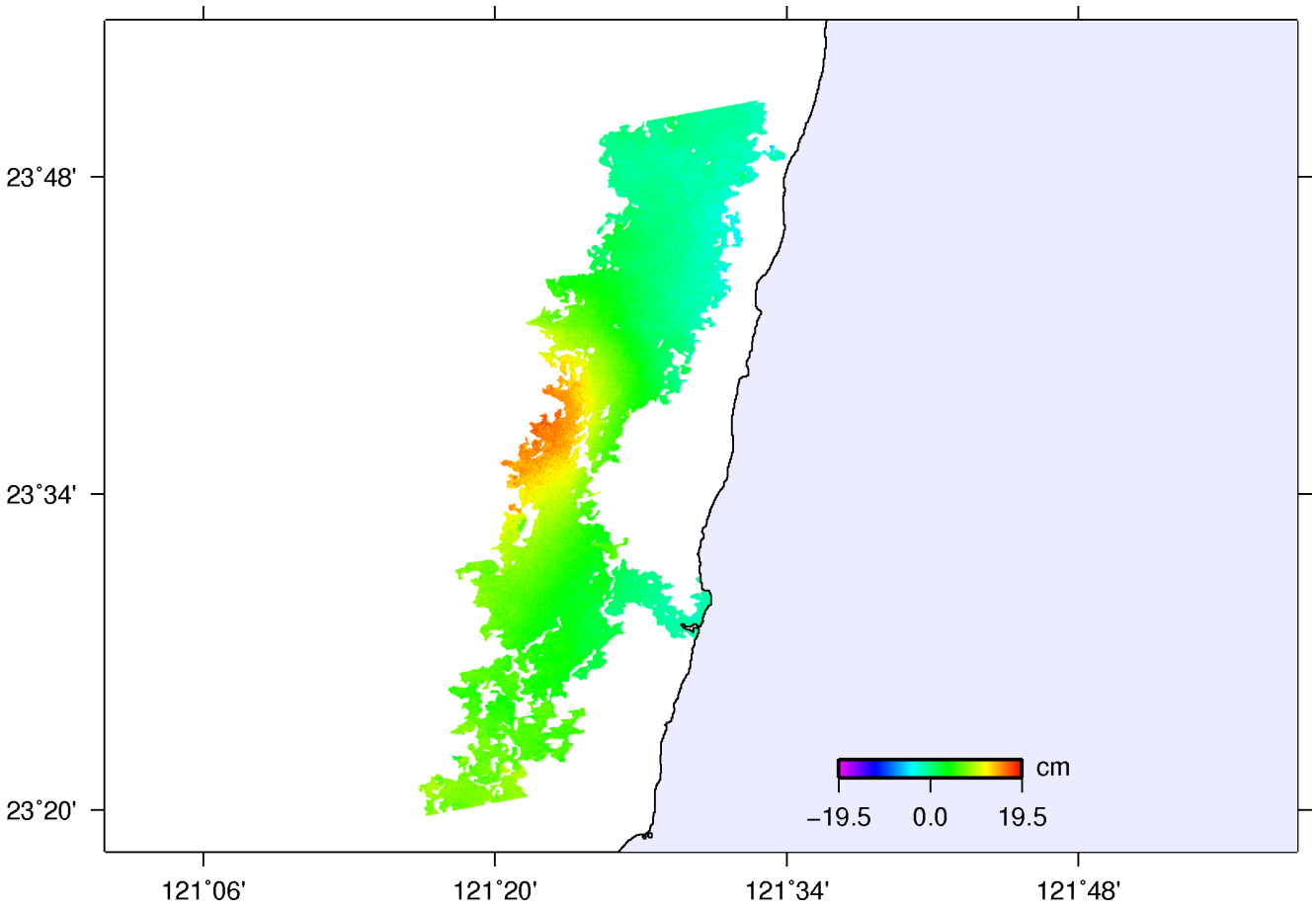

Figure 4: Unwrapped differential interferogram calculated from two RADARSAT-2 MF3 images acquired on 20130716–20131113 from ascending orbit, right looking geometry. Perpendicular baseline is -54 m. This data is provided in GMT grid file format.

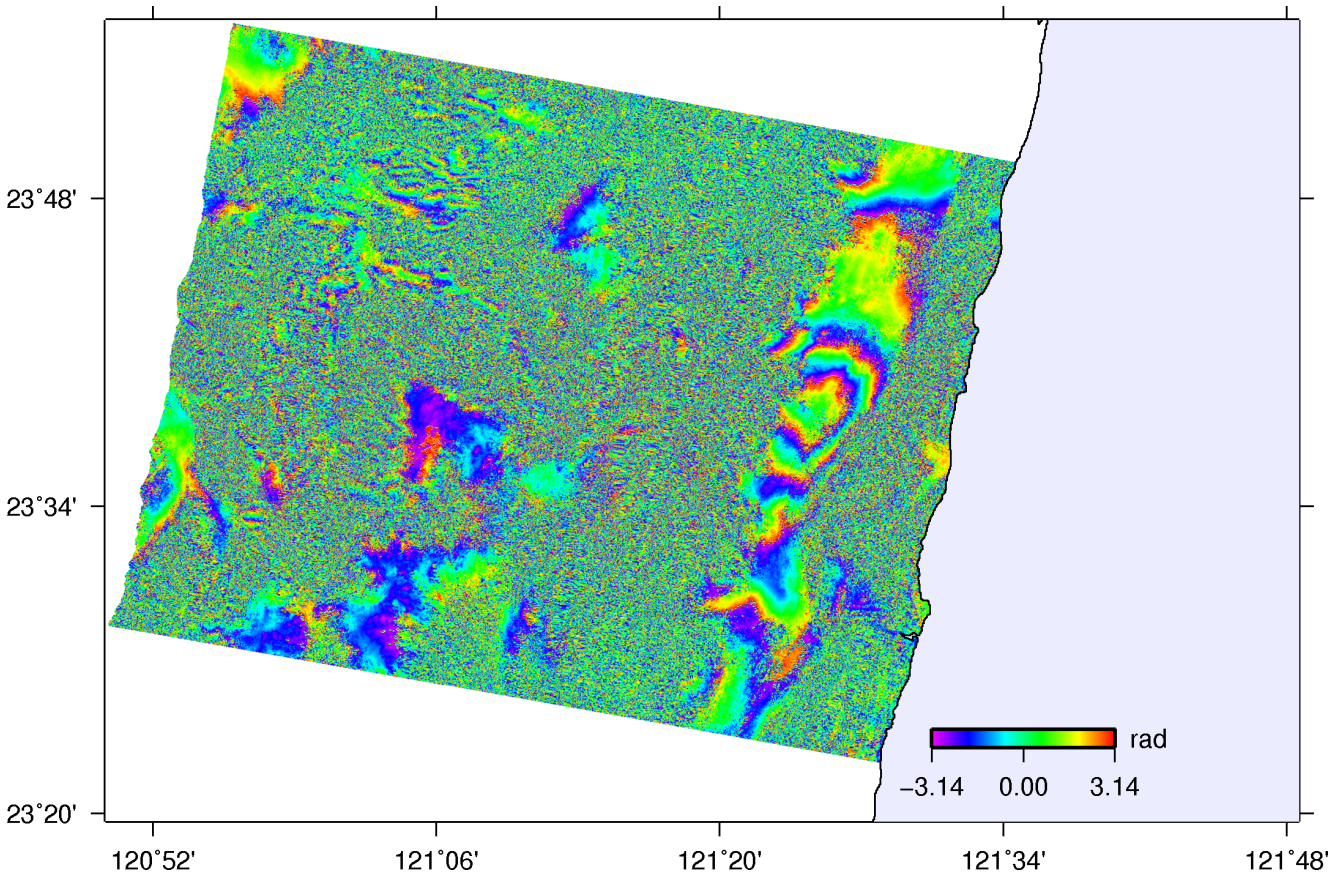

Figure 5: Filtered wrapped differential interferogram calculated from two RADARSAT-2 MF6 images acquired on 20130627–20131118 from descending orbit, right looking geometry. Perpendicular baseline is 119 m.

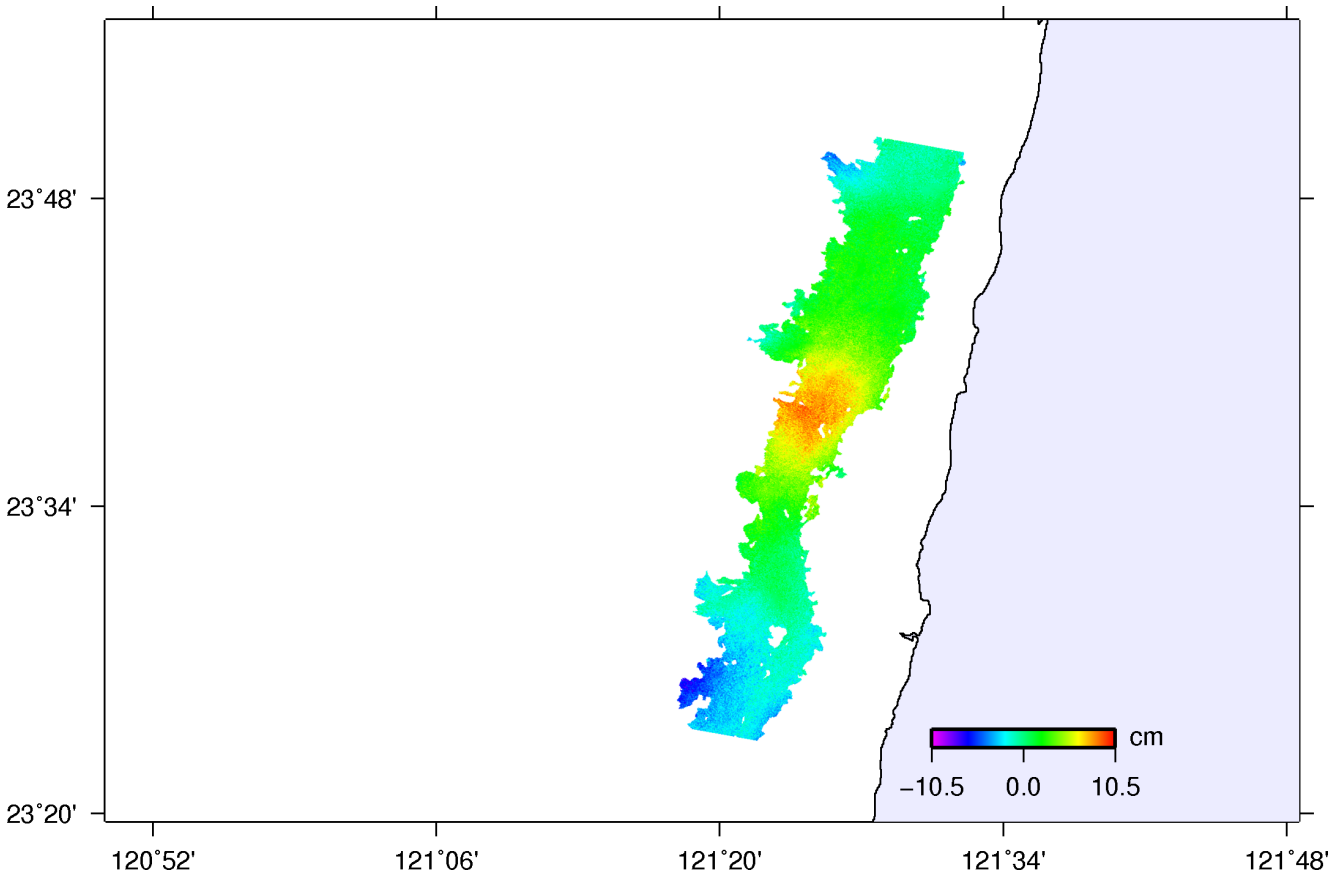

Figure 6: Unwrapped differential interferogram calculated from two RADARSAT-2 MF6 images acquired on 20130627–20131118 from descending orbit, right looking geometry. Perpendicular baseline is 119 m. This data is provided in GMT grid file format.

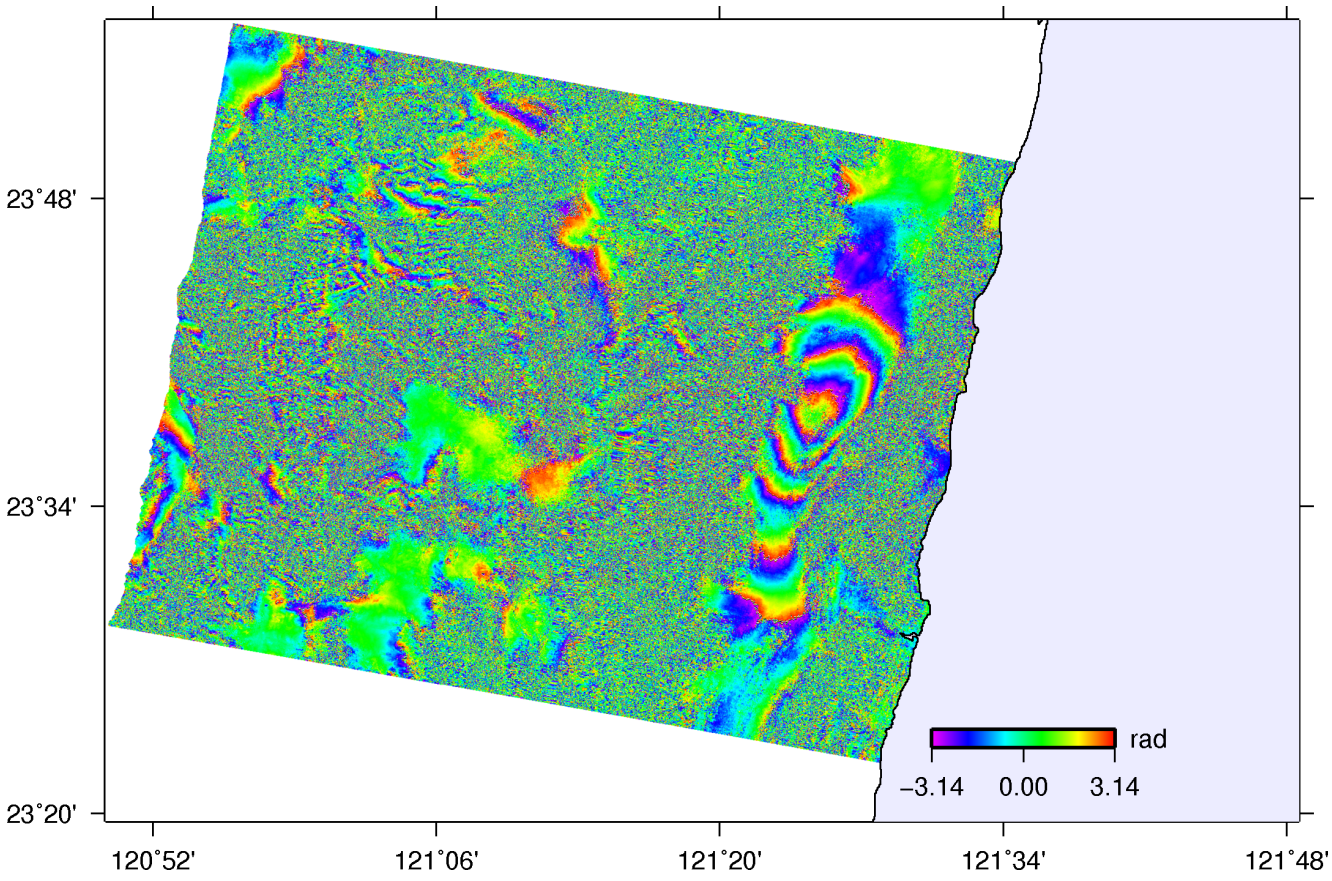

Figure 7: Filtered wrapped differential interferogram calculated from two RADARSAT-2 MF6 images acquired on 20130721–20131118 from descending orbit, right looking geometry. Perpendicular baseline is 82 m.

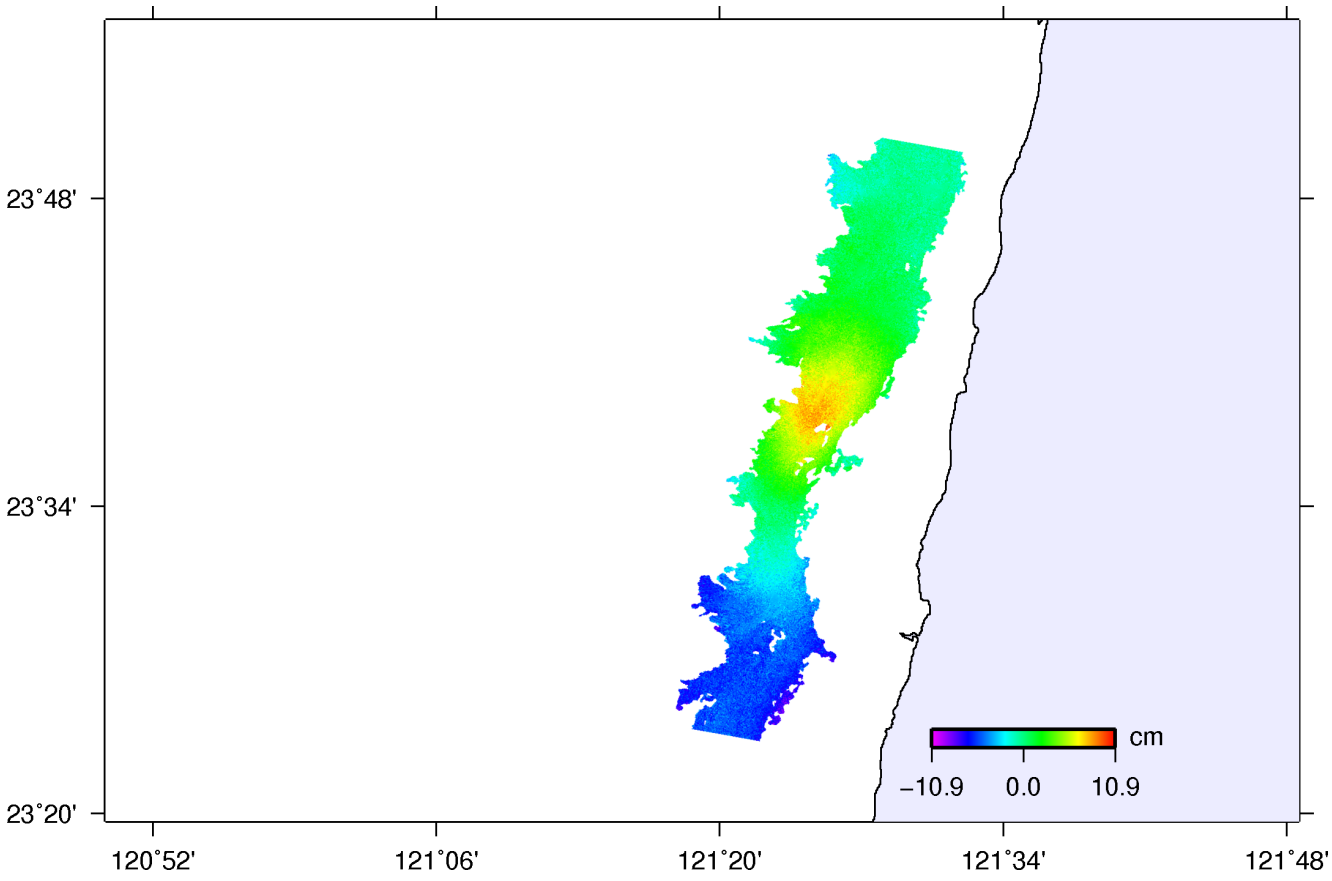

Figure 8: Unwrapped differential interferogram calculated from two RADARSAT-2 MF6 images acquired on 20130721–20131118 from descending orbit, right looking geometry. Perpendicular baseline is 82 m. This data is provided in GMT grid file format.

Data folder names are in the following format SATELLITE-BEAM:

RADARSAT2_MF3

RADARSAT2_MF6

Description of files:

*.rmli.par.txt – parameter file of master image describing satellite, beam and processing parameters

*.adf.diff.png – wrapped filtered interferogram

*.adf.unw.png – unwrapped filtered interferogram

*adf.unw.geo.png and *adf.unw.geo.kml – Google Earth kml files (unwrapped interferogram re-wrapped for visualization)

*adf.unw.grd – GMT (the Generic Mapping Tool) grid file of unwrapped filtered interferogram (final product)

bperp.txt – interferogram baseline information file

lv_theta.png – SAR look-vector elevation angle

lv_theta.grd – GMT grid file of SAR look-vector elevation angle

lv_phi.png – SAR look-vector orientation angle

lv_phi.grd – GMT grid file of SAR look-vector orientation angle

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