

Grounding line 検出における多周波数 SAR 利用の試み

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Application of Multi-frequency SAR Data for Detection of Grounding Line

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It is important to reveal position change of grounding lines in Antarctica for estimating ice mass balance precisely because it is connected to the in deep understanding of relationship with global climate change. The use of spaceborne Synthetic Aperture Radar (SAR) is practically most suitable because of the cloud-free and broad areal visibility. By an application of SAR Interferometry (InSAR), we can detect precise positional change of grounding line to a resolution of 50 m. ERS-1 and ERS-2 provided the most suitable SAR data pairs for InSAR analysis in tandem mission because of the short temporal interval and well-controlled spatial baseline. However, ERS tandem operations were finished in the 1990s and it is necessary to observe “recent” grounding line position for detection of decadal change by applying the InSAR using ALOS / PALSAR and TerraSAR-X / Tandem-X combinations. PALSAR was launched and operated by JAXA during 2006 -2011 and TerraSAR-X is by DLR (German Aerospace Center) from 2007 to the present. For the application to PALSAR data, we successfully revealed the grounding line in several parts of East Antarctic ice sheet - ice shelf marginal region, despite of its long repeat interval (46days). Red lines in Figure 1 show the extraction results of grounding line by PALSAR data. However, similar trial for TerraSAR-X was failed, most likely due to the increase in snow accumulation during the 11 days repeat interval, because short observation wavelength of TerraSAR-X (X band: 3.15cm) have serious damage to the coherency by snow accumulation than ALOS / PALSAR (L band: 24cm).

Japanese new SAR satellite ALOS-2 was launched in the last May and it is supplying the L-band SAR data with the revisit cycle of 14days. It is expected to give more precise interferogram for this research area and we plan to study decadal change using this sophisticated data.

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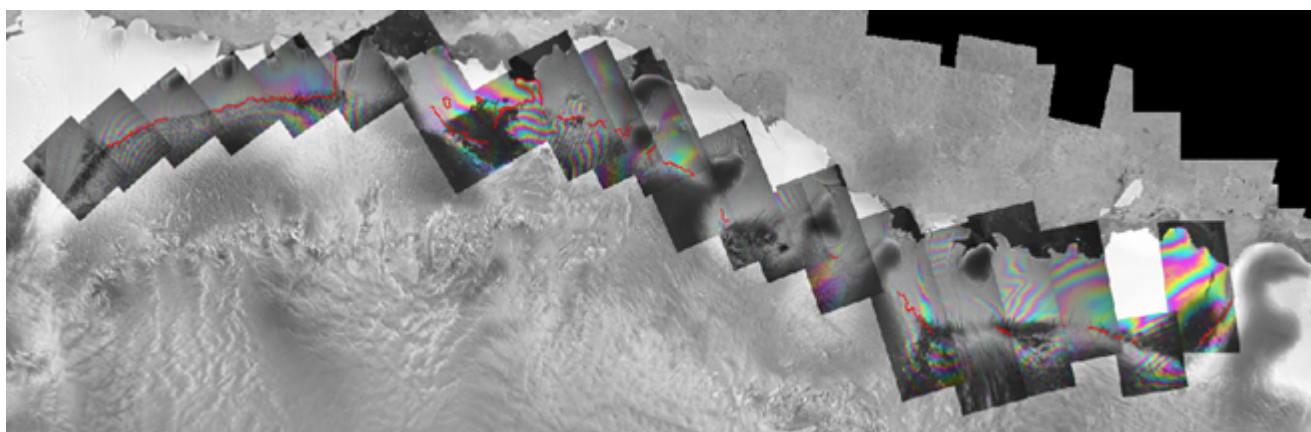


Figure 1. Grounding line extracted results by ALOS / PALSAR data.