

## On the detection of ice sheet height change by means of space geodetic techniques

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Satellite gravity mission GRACE will provide a time series of Stokes' coefficients as the observation data. Estimation of redistributed mass is important for the validation of the derived data. Space geodetic technique like as interferometric synthetic aperture radar (InSAR) and GPS measurement is effective to detect displacements of ice sheet. GPS measurement is an established technique to detect surface displacement precisely, and have already applied to estimate flow rate of ice sheet (e. g. Ootaki and Fujiwara, 1998). Spaceborne InSAR can observe wide area at once and detect surface displacement. InSAR is, therefore, a promising tool to detect volume changes of wide continental ice sheets directly.

We will present some results obtained by InSAR processing applied to ERS-1/2 tandem data that were acquired at Syowa Station in 1996 and 1999. The main observed area is Antarctic ice sheet around Syowa Station. Multi-pass method is applicable to some scenes of the tandem data and we can separate topographic fringe and fringe due to surface displacement appeared in the interferograms of the corresponding scenes. In this study, we will discuss a probability to detect the surface height change of ice sheet from the difference of the topographic fringes.

GPS measurements had been conducted at several points on Antarctic ice sheet in the 41st Japanese Antarctic Research Expedition (1999-2001). We are also going to show the obtained results.

There are some problems in applying InSAR and GPS to estimate height change of Antarctic ice sheet. Complementary use of these techniques will make it possible to solve some of the problems.