

Integrated geodetic observation of post-glacial rebound in south Alaska and estimation of viscoelastic structure of the earth

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Since the polar region is considered to be one of the most sensitive regions to the effect of global warming, monitoring of the glaciers in the high latitude region with many different kinds of observation means is important to evaluate the future effect of global warming and the related phenomena. Recent high sensitive and accurate geodetic measurements surely detect the ice mass changes through the observed gravity changes and the crustal uplifting due to the effect of unloading by the past- and present-day ice changes (for example, Larsen et al., 2004; Sato et al., 2005). Ice mass changes are also important in the geophysics, because it gives us a useful data to study the viscoelastic structure inside the earth and to constraint the flow of the mantle. However, usually, it is difficult to separate the uplift rate due to the long-term viscous response of the earth (i.e. post glacial rebound) and the effect of short-term elastic deformation (i.e. effect of the present-day ice mass changes) by only using displacement observation, because two effects of the elastic and viscous deformations are mixed up in the observed data. By combining use of the gravity data with the displacement data, we may have an opportunity to discuss this problem separately (Wahr et al., 1995).

For the purpose to study the glacial isostatic adjustment(GIA) in southern Alaska, we started a joint observation project between Japan and USA on 2005 as a four years project. In this short report, outline of the project is explained.