

Collapse of the peripheral bulge around Antarctica inferred from GIA modeling

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The loss of the Antarctic ice mass is accelerating due to recent global warming. Changes in Antarctic ice mass have been observed as the gravity change by GRACE (Gravity Recovery and Climate Experiment) satellites. However, the gravity signal includes both the components of the ice mass change and the solid Earth response to surface mass change (Glacial Isostatic Adjustment, GIA). Namely, to constrain on the ice mass change from the gravity observation, ice history from the last deglaciation and viscosity structure of the Earth's mantle are required with sufficient accuracy. In this study, we focus on change in the gravity field at the peripheral bulge around the Antarctic ice sheet, which is the area that the GIA signals are relatively large in the coastal region around Antarctica. At present, the gravity field around Antarctica should be changing with the crustal subsidence associated with collapse of the peripheral bulge; however, no such observation has been reported. Here we examine changes in the gravity field driven by collapse of the peripheral bulge using GIA modeling. We also explore the sensitivities of gravity change at the peripheral bulge to ice history and mantle viscosity. In this presentation, we intend to discuss the verification of whether collapse of the peripheral bulge can be detected using GRACE data.