

Effect of crustal deformation due to surface loads on the ocean depth around Antarctica

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Abstract

The depth of the continental shelf edge around the Antarctica is observed in about 500-900 m below sea level, and that is very deep in comparison with the its values in the mid- to low-latitude. The Antarctic ice sheet loading on the Earth's surface typically causes for the subsidence of the Antarctic margin. Accordingly, the growth and decay history of Antarctic ice sheet through the Cenozoic era affects the topographic evolution of the continental shelf. However, very few numerical studies have been reported on the relation between the depth of continental margin and the Antarctic glacial history. In order to know the effect of the glacial history on the surface elevation change, we need to evaluate the glacial isostatic adjustment (GIA) process induced by ice load change numerically. In this presentation, we show the difference between the continental shelf depth of Antarctica and other continents. quantitatively, and estimate the effects of ice sheet loading on the depth distribution of the continental shelf around the Antarctica based on the GIA modelling. In addition to this, we also calculate the effect of the sediment loading on the depth of continental margins, and discuss the main cause for deepening the water depth of the Antarctic continental shelf.

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