

南極大陸縁辺部の大陸棚深度に関する考察

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Some remarks on the depth of the continental shelf around the Antarctic continental margin

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The growth and decay of the Antarctic ice sheet in the Cenozoic era have affected the historical landform development of the Antarctic continent and its margin. Generally the depth of the Antarctic continental shelf is about 500-900 m, and it reaches 1000 m in some areas. So the depth of the continental shelf around the Antarctica is very deep in comparison with that of other continental shelves in the world. On the other hand, the conventional geophysical observations, which are gravity and topography, suggest that the long-wavelength features around the Antarctic continent indicate almost isostatic equilibrium state. This result means that the present Antarctic ice sheet as a surface load deforms the Earth. Hence, the cause of deeper ocean depth of the continental shelf in Antarctica is considered to be the crustal subsidence induced by the ice sheet loading. However, very few quantitative evaluations about the relation between the depth of continental margin and Antarctic ice sheet loading have been reported. In order to know the effect of the ice sheet loading 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 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.