過去 300 万年間における東南極氷床高度変動の復元
：ドローニング・モード・ランド東・中部における南極地域観測計画

Reconstruction of the East Antarctic ice sheet variability during the last 3 Ma: A perspective for future JARE expeditions at the central & eastern Droning Maud Land

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Reconstructing past variability of the Antarctic ice sheets is essential to understand their stability and to anticipate their contribution to sea level change as a result of future climate change in a high-CO2 world. Recent studies have reported a significant decrease in thickness of the East Antarctic Ice Sheet (EAIS) during the last several million years. However, the geographical extent of this decrease and subsequent isostatic rebound remain uncertain and a topic of debate. Recently, we reconstructed magnitude and timing of ice sheet retreat at the central part of the Sør Rondane Mountains in Dronning Maud Land, East Antarctica, based on detailed geomorphological survey, cosmogenic exposure dating, and glacial isostatic adjustment modeling (GIA). Three distinct deglaciation phases are identified in this area during the Quaternary and the ice sheet thinning is estimated to be at least 500 m during the Pleistocene. Although this is the first attempt to estimate the absolute thickness of the EAIS thinning during the Quaternary with GIA modeling, local effects, such as regional ice flow and damming, to the ice sheet thickness reconstruction remain unclear. Here, we propose that a new expedition plan for the Japanese Antarctic Research Expedition (JARE) for providing a better constraint for the EAIS thickness reconstruction during the last 3 Ma. In this plan, we are going to carry out expeditions in the central and eastern Dronning Maud Land. We target to study glacial history in (1) middle to late Pliocene when atmospheric carbon dioxide level was high, and (2) Pleistocene when carbon dioxide level decreased and glacial-interglacial variations happened. In addition, we explore more recent changes in (3) the Holocene, depending on the availability of geological samples. These will contribute further understanding of the glacial dynamism of the EAIS in the warm world and interaction with the reorganization of the Southern Ocean circulation through the moisture transport from the Southern Ocean to the interior.