Antarctic ice sheet dynamics during the Last Interglacial

*飯塚 睦¹、関 宰¹、堀川 恵司³、Tina van de Flierdt²、入野 智久¹、山本 正伸¹、板木 拓也⁴、杉崎 彩 \mathcal{F}^4 、池原 実⁵、菅沼 悠介⁶

*Mutsumi lizuka¹, Osamu Seki¹, Keiji Horikawa³, Tina van de Flierdt², Tomohisa Irino¹, Masanobu Yamamoto¹, Takuya Itaki⁴, Saiko Sugisaki⁴, Minoru Ikehara⁵, Yusuke Suganuma⁶

1. 北海道大学、2. インペリアルカレッジロンドン、3. 富山大学、4. 産業技術総合研究所、5. 高知大学海洋コア総合研究センター、6. 国立極地研究所

1. Hokkaido university, 2. Imperial College London, 3. University of Toyama, 4. Geological Survey of Japan, 5. Center for Advanced Marine Core Research, Kochi University, 6. National Institute of Polar Research

Ongoing global warming could cause various problems in the future. One of the serious concerns

potentially caused by the global warming is a sea level rise due to the melting of ice sheet. Antarctic

ice sheet, which hold a massive amount of fresh water, was considered to be stable even if global

warming progresses in a future. However, recent studies have shown that Antarctic ice sheet is more

sensitive to global warming than previously thought. Therefore, it is an important to better understand

extent to which Antarctic ice sheet sensitive to global warming.

Study of past warm period provides a useful insight into the prediction of sea level rise in a future. In particular, the last interglacial (MIS 5e), which was ~1°C warmer than that of the preindustrial, is receiving increased attention, since sea level in the period is estimated to be several meters higher than that of the present. This suggests substantial loss of Antarctic ice sheet during MIS 5e. However, variability of Antarctic ice sheet during MIS 5e has been poorly understood. In this study, we generate high resolution records of mineral composition, Nd isotope and iceberg rafted debris (IBRD) in GC1407 collected from near the Wilkes Basin, East Antarctica (130.518°E, 63.74°S) in order to better understand Antarctic ice sheet dynamics during the warmer than the present climate condition. The two episodic IBRD increase events are found to be recognized during MIS 5e in GC1407, suggesting that increases in icebergs transport occurred during MIS 5e. Nd isotope and mineral composition records in GC1407 suggest that icebergs originated from area with relatively higher eNd, possibly either Wilkes Land Basin or West Antarctica ice sheets. The iceberg discharge events happened when Antarctic air temperature was warmer than that of preindustrial era, suggesting a link between Antarctic warming and increase in iceberg discharge. Furthermore, the timings of iceberg discharge events are simultaneous with the onsets of sea level rises estimated from geological record in Western Australia. The correspondence between the sea level and Antarctic ice sheet records suggests substantial contribution of Antarctic ice mass loss to the sea level rises during MIS 5e. +-9-1: 南極氷床、最終間氷期、ネオジウム同位体

Keywords: Antarctic Ice Sheet, Last interglacial, Nd isotope