Reconstruction of the East Antarctic Ice Sheet history in the Lutzow-Holm Bay using in situ produced cosmogenic nuclides.

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Global sea level rose ca. 130m from Last Glacial Maximum (LGM) to present. Most of the melt water came from the Northern hemisphere, yet significant amount of water also may have original from Antarctica. Rapid climate change (Heinrich events) during last glacial found in the Greenland ice cores and associated the global sea level rose 15m to 30m, and collapse of the Antarctic Ice Sheet is also anticipated (Yokoyama *et al*., 2001; Siddall *et al*., 2003). However, little data is available of ice sheet fluctuation of the Antarctic Ice Sheet is compared with the one of Northern hemisphere ice sheet, hence the relation between the Antarctic Ice Sheet and global climate change is not clear. We used in-situ produced cosmogenic radionuclide (in-situ CRN) in rocks from the Lutzow-Holm Bay to reconstruct the history of the East Antarctic Ice Sheet.

Samples were obtained from the Soya Coast located the east coast of the Lutzow-Holm Bay. The Skarvsnes area is the largest ice-free area in the coast and we mainly focused on measuring in-situ CRN. We collected 12 gneiss samples from 10 sites of this area that consisted of 9 bedrock samples and other 3 erratic samples. The concentration of in situ produced cosmogenic nuclides in quartz provides the cumulative exposure time of the rock. This study used Beryllium-10 (^{10}Be: half-life = 1.5 Myr) and Aluminum-26 (^{26}Al: half-life = 0.7 Myr). Also, the ratio (e.g. ^{26}Al/^{10}Be ratio) of two cosmogenic nuclides provides buried histories of rock.

^{10}Be and ^{26}Al ages of bedrock were ranged from 8 to 33ka, whereas, ages of erratics are all younger than 10ka. Also, some of ^{26}Al/^{10}Be showed significantly below the equilibrium ratio of ˜6.1 for a con-tinuously exposed sample, and these samples suggest complex exposure history. According to the age distributions and measured ratio in ^{26}Al/^{10}Be, we could deduce following ice history of this region of the East Antarctic Ice Sheet. 1) The Skarvsnes region has been ice free during the last 10ka. This scenario consists with the study reported using ^{14}C ages on fossil shells in raised beach deposits (e.g. Miura *et al*., 1998). 2) The eastern part of this region must have been under the East Antarctic Ice Sheet for at least 2-3 million years and did melt several times during the last 2-3 million years. 3) Ice free situation like today was very rare during the last 2-3 million years.