Geophysical Research Abstracts, Vol. 9, 04762, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04762

Millennial-scale variation of mineral dust at Dome Fuji, Antarctica during the last glacial period.

K. Goto-Azuma (1), M. Igarashi (2), H. Motoyama (1), K. Kamiyama (1), H. Shoji (3), Y. Fujii (1), O. Watanabe (1), M. Hirabayashi (1) and T. Miyake (1)

(1) National Institute of Polar Research, Japan, (2) Riken, Japan, (3) Kitami Institute of Technology, Japan (kumiko@pmg.nipr.ac.jp)

The oxygen isotope record from the deep ice core drilled at EDML (EPICA-Dronning Maud Land) shows a one-to-one coupling between all the millennial-scale Antarctic warming events and Greenland Dansgaard-Oeschgar (D-O) events by the bipolar seasaw. In Greenland, mineral dust concentrations and fluxes also show significant millennial-scale variations corresponding to D-O events. Concentrations and fluxes are low during the stadials and high during the interstadials. It has been reported by Shoji and others (2003) that calcium, nitrate and sulfate concentrations in a deep ice core retrieved from Dome Fuji, East Dronning Maud Land, Antarctica show millennial-scale variations corresponding to 11 of the Greenland D-O events. Here we take a closer look at the calcium record from Dome Fuji, and compare them with the Greenland calcium record. We find 24 peaks in the Dome Fuji calcium profile, corresponding to 24 of the 25 D-O events. Calcium concentrations and fluxes are high during cold phases of millennial-scale variations in the Antarctic temperature, and low during the Antarctic warm events. This suggests that mineral dust fluxes show a bipolar seasaw, i.e. when Greenland flux is high, Antarctic flux is low, and vise versa. Since the major source region of mineral dust in Greenland is central Asia and that for Antarctica is Patagonia, this seasaw of mineral dust flux variations suggests a close link between the environmental changes in central Asia and Patagonia.