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GEOGRAPHICAL VARIATIONS IN SR-ND ISOTOPIC RATIOS OF MINERAL DUST IN ARCTIC SNOW

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Snow and ice on glaciers contain various atmospheric depositions, such as soot and mineral dust. These light-absorbing impurities can reduce surface albedo and affect melting of glaciers. Thus, it is important to understand how these impurities were supplied on glaciers.

Stable isotopic ratios of strontium (Sr) and neodymium (Nd) provide a means of identifying sources of substances and have been commonly used in loess or sediment studies¹. In this study, we analyzed Sr and Nd isotopic ratio of the mineral dust collected from snow in several Arctic regions (Mongol, Alaska, and Greenland).

The Sr and Nd isotopic ratios of mineral dust in Arctic snow showed geographical variations among the sampling sites. The dust collected from snow in Mongol showed higher Sr and lower Nd values, while those in Greenland were higher Sr and lower Nd values. This suggests that origins of mineral dust in snow are substantially different among the regions. Compared with the isotopic ratios of loess, desert sand, soil, or moraine reported over the regions, those of the dust from Mongol and Greenland were close to those of respective regions. This result indicates that mineral dust in snow from the two sampling sites were mainly derived from surrounding regions. On the other hand, the isotopic ratios of dust in Alaskan snow were close to those of deserts in Kazakhstan and Taklamakan Desert, suggesting that the mineral dust was transported from such further deserts to Alaska.

¹ Goldstein, S. L. et al (1984): A Sm–Nd isotopic study of atmospheric dusts and particulates from major river systems, *Earth Planet. Sci. Lett.*, Vol.70, 221–236.