

Sulfur isotope analysis of sulfate over the last deglaciation in Antarctica: source estimation for sulfate aerosols

*Ryu Uemura¹, Kosuke Masaka¹, Risei Matsumoto¹, Miki Uemura¹, Yoshinori Iizuka², Motohiro Hirabayashi³, Hideaki Motoyama³

1. University of the Ryukyus, 2. Hokkaido University, 3. National Institute of Polar Research

The sulfate aerosols record preserved in polar ice cores provide important clue on for understanding the relationship between past variations of aerosols and climate. However, changes in sulfur contributions from various sources, such as marine biogenic sulfur, volcanoes, and sea salt, remain unclear. Sulfur stable isotopic values ($\delta^{34}\text{S}$) of sulfate aerosols can be used to assess oxidation pathways and contributions from various source. Here, to investigate the change in changes in sulfate sources over glacial cycle, we measured the sulfur isotopic composition of sulfate in Antarctic Dome Fuji ice core. A relatively high time-resolution allows us to examine timing between the changes in $\delta^{34}\text{S}$ and other climate proxies (temperature and fluxes of aerosols). The $\delta^{34}\text{S}$ data during Holocene is consistent well with modern surface snow observation in this region. The $\delta^{34}\text{S}$ values show distinct increase from the Last Glacial Maximum to Holocene, suggesting that changes in sulfur source under the different climatic conditions.

Keywords: ice core, sulfate aerosols, stable isotope, glacial cycle