

Understanding of hydrological circulation of Arctic region using ^{17}O -excess variation in SIGMA-D ice core

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The stable water isotope ratios ($\delta^{18}\text{O}$, δD and d-excess which is calculated from δD and $\delta^{18}\text{O}$) in ice cores are important proxy of paleo climate change. Recently, $\delta^{17}\text{O}$ and ^{17}O -excess which is calculated from $\delta^{18}\text{O}$ and $\delta^{17}\text{O}$ have attracted attention as a promising new proxy of hydro-climate variation. In this study, we measured $\delta^{17}\text{O}$, $\delta^{18}\text{O}$ and δD in an ice core, which was obtained from the northwest Greenland using Wavelength-Scanned Cavity Ring-Down Spectroscopy (model L2140-i; Picarro) with high precision at the National Institute of Polar Research. And we also calculated d-excess and ^{17}O -excess from those. For last 80 years, the correlation of ^{17}O -excess and d-excess is definitely changed with period of 10 to 20 years. The correlation of those shifted in 1967, that is, we showed sea-level pressure in periods 1(1949-1967) and 2(1968-1980) (NCEP Reanalysis data provided by the NOAA/OAR/ESRL PSD, Boulder, Colorado, USA, from their Web site at <http://www.esrl.noaa.gov/psd/cgi-bin/data/composites/printpage.pl>). During the periods 2, the high-pressure area extended across the whole Greenland, therefore, water vapor was hard to reach to SIGMA-D site. We think that the moisture influx route to SIGMA-D site and its amount changed due to the climate field change, resulting the changes of those correlations.

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