

AAS002-09

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## Modulation of the arctic origin snow to Siberia

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Stable water isotope tracers (HDO, H<sub>2</sub>18O) reflect the integrated histories of both condensation and evaporation during transportation from the oceanic source region.

To evaluate hydrological change due to sea ice reduction in the Arctic ocean, we have launched monitoring network of precipitation isotopes in 2004 over the Siberia region. The long-term isotope monitoring data obtained from northern Siberia showed clear isotope shift that seems to relate with recent sea ice loss in Arctic Ocean. The maximum peak of d-excess value, (defined as  $d = \delta D - 8\delta^{18}O$ ) a second parameter that reflects the origin of precipitation, is appeared in autumn after 2006, and most prominent autumn peak was observed in 2007 when sea ice cover reached minimum extent. In Siberia, all precipitation events with higher d-excess values than that of average occurred at dominating northerly wind associated with low-pressure system or being covered with high-pressure. Besides, in Arctic Ocean, the highest d-excess value of evaporated water from open water was observed (up to more than 25) when rapid evaporation occurred associated with cold air outbreak during the autumn. These results suggest that moisture supply from the Arctic Ocean is enhanced by rapid evaporation, and then this moisture significantly contributes to the autumn snowfall in Siberia. Although heat flux from the Eurasian sector of Arctic Ocean is smaller than that from the Pacific sector, significant influence of Arctic origin from Pacific sector may be shown in Siberia.

Keywords: Arctic Ocean, Water vapor origin, stable isotope tracer