Stable isotopic content of atmospheric precipitation and natural waters in the vicinity of Barentsburg (Svalbard) in 2016–2018

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Precipitation

NOAA HYSPLIT Backward trajectory [6]

\[ d_{\text{exc}} = \delta D - 8 \delta^{18}O \]

indicates location of the moisture source

Here: High \( d_{\text{exc}} \) means moisture from the North,
low \( d_{\text{exc}} \) – South.

\[ d_{\text{exc}} = -6.8\% \]

30 Oct 2016

\[ d_{\text{exc}} = 45.1\% \]

17 Mar 2017

Precipitation collecting device, Barentsburg, 2016-18
Kongressvatnet (Kongress lake)

Lake and valley tributaries
Can be separated into 2 feeding groups

Atmospheric moisture or Groundwater
Groundwater:
Lower $d_{exc}$ and higher $\delta D$, $\delta^{18}O$ than for Atmospheric.
Atmospheric:
Located along LMWL

Conclusions:
1) Relation between air temperature and isotope composition of precipitation depends on the station.
2) $d_{exc}$ can be used as a marker of precipitation source.
3) We can check feeding type of tributaries using isotope composition.
4) Kongress shows small variability of isotope composition (2016\2017).

More info: Skakun A.A. et al., 2020 (accepted), Demidov et al., 2019
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