EGU21-4112
https://doi.org/10.5194/egusphere-egu21-4112
EGU General Assembly 2021

A dual-tube sampling technique for snowpack studies

Remi Dallmayr, Johannes Freitag, Maria Hörhold, Thomas Laepple, Johannes Lemburg, Damiano Della Lunga, and Frank Wilhelms
Alfred Wegener Institut, Glaciology, Bremerhaven, Germany (remi.dallmayr@awi.de)

The validity of any glaciological paleo proxy used to interpret climate records is based on the level of understanding of their transfer from the atmosphere into the ice sheet and their recording in the snowpack. Large spatial noise in snow properties is observed, as the wind constantly redistributes the deposited snow at the surface routed by the local topography. To increase the signal-to-noise ratio and getting a representative estimate of snow properties with respect to the high spatial variability, a large number of snow profiles is needed. However, the classical way of obtaining profiles via snow-pits is time and energy-consuming, and thus unfavourable for large surface sampling programs. In response, we present a dual-tube technique to sample the upper metre of the snowpack at a variable depth resolution with high efficiency. The developed device is robust and avoids contact with the samples by exhibiting two tubes attached alongside each other in order to (1) contain the snow core sample and (2) to access the bottom of the sample, respectively. We demonstrate the performance of the technique through two case studies in East Antarctica where we analysed the variability of water isotopes at a 100 m and 5 km spatial scales.