



Continuous profiles of microstructure, stable water isotopes and impurity content of the 2m snow pack from three polar drill sites

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Interpreting polar ice as climate archive requires profound knowledge about the formation of climate-proxies within the upper snow column. In order to investigate different impact factors on signal formation we performed a multiproxy- approach for 2m deep snow profiles by continuously measuring the 3D-microstructure using core-scale X-CT and the isotopic composition and impurity load in discrete samples of 1.1cm spatial resolution. The study includes profiles from a low-accumulation site on the East Antarctic plateau (Kohnen Station, DML), a typical medium-accumulation site on the North-East-Greenland ice sheet (EGRIP drilling camp) and a high-accumulation site on the Renland ice cap (East-coast of Greenland, RECAP drilling camp). Major observations are the tooth-shaped imprint of structural anisotropy and sulfate concentrations at the low accumulation site, the clear isotopic inter-annual variations that are in line with distinct impurity peaks at the high-accumulation site and the unexpected missing footprint of ice crusts and refrozen melt layers within the impurity- and isotope records for all sites.