

## **Basal ice processes in Severnaya Zemlya archipelago, High Russian Arctic**

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Akademii Nauk ice cap, in the Severnaya Zemlya archipelago (High Russian Arctic), is one of the largest arctic ice caps. However, due in part to its inaccessibility, little is known on the local climate and glaciological history. In order to cast light on the ice cap dynamics, we present here the results from geochemical (gas content,  $\delta^{18}\text{O}$ ,  $\delta\text{D}$ ) and crystallographical analysis of the basal 8 m of a 724 m deep ice core drilled on the ice cap. The basal zone is characterized by an alternation of silt-rich and clean ice layers, in strong contrast with the upper hundreds meters of clean glacier ice. Co-isotopic data in the basal zone fairly align on the LMWL, indicating that no fractionation has occurred at the scale of sampling. This supports the reliability of the isotopic signal for palaeo-climatic reconstruction. Gas composition and volume, however, differ from the gas content of standard meteoric ice, in a way very similar to what was found at the base of GRIP deep drilling site. A significant  $\text{CO}_2$  and  $\text{CH}_4$  enrichment, associated with  $\text{O}_2$  and gas volume depletion, were indeed observed in the ice. These characteristics strongly suggest the occurrence of micro-scale phase changes and/or biogenic activity during basal ice evolution. Ice dynamics and related subglacial processes are inferred from these and previous results.