



## **Paleoclimatic ice core studies in the Caucasus Mountains as a base for a new paleoclimatic reconstruction for the low latitudes of the Northern Hemisphere: prospects and first results.**

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Detailed maps of the ice surface and bedrock were obtained using the radio-echo sounding on the western Elbrus firn-plateau, where the ice thickness is a maximum of 240.8 m. The flat ice surface and the relief of the bedrock could be an evidence of the unknown volcanic crater on Elbrus Mountain.

A shallow ice-core borehole (21.41 m) has been drilled in the central part of the plateau; this shows that the firn density distribution had a monotonic character and varied from 210 kg/m<sup>3</sup> for the upper part of ice-core to 680 kg/m<sup>3</sup> at a depth of 21.4 m. The firn temperature at a depth of 10 m (active layer) was -17°C.

A clear seasonal signal was revealed in the isotopic composition of the firn pack. The minimum values of the isotopic composition ( $\delta^{18}\text{O}$  and  $\delta\text{D}$ ) were -28‰ and -206‰ respectively. These low values show that vapour condensation and snow accumulation took place under subzero temperatures during the whole year. Strong correlation of  $\delta^{18}\text{O}$  and  $\delta\text{D}$  has been revealed and the meteoric water equation has been obtained. The Aanderaa Automatic Weather Station AWS 2700 has been installed on the (~ 5150 m a.s.l.) western Elbrus firn-plateau at the end of the summer 2007. The internal structure, temperature regime and isotopic composition of the firn pack of the western Elbrus firn plateau provide clear evidence of a re-crystallisation zone of ice-formation at 5150 m a.s.l. These results show that this plateau is an ideal location for a deep ice-

core drilling project in Europe. Indeed, it is planned that deep ice-core drilling will take place in summer 2008.

The results of the deep ice-core drilling project will enable the reconstruction and better understanding of climate change and its effect on high-mountains. This project has been accepted by the IPY International Committee as project #366 and is included in the Russian National IPY Program. The study was supported by the RFBR grant number 07-05-00410.