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Formation of the isotopic composition of snow at the Elbrus highlands (Caucasus) based on ice cores investigations

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The results of the isotopic investigations of several ice cores obtained at the Western Plateau of the Mt. Elbrus (Caucasus) are presented. The isotopic composition of the upper part (60 m) of the deep ice core (182 m) obtained in 2009 is also discussed. According to our estimations this core covers last 400 years. There is distinct seasonal cycle in the isotopic composition record of these cores. High accumulation rate (mean accumulation rate 1450 mm w.e. per year) and precise sampling resolution (20-25 samples for one year cycle) allowed obtaining seasonal values of the isotopic composition and accumulation rate. Dating of the cores was performed based on annual layers counting and was corrected using precisely dated dust layers. Mean year and mean seasonal values of the isotopic composition and accumulation rate were calculated for 33 years (1979-2011). These values were compared with available meteorological records (10 stations) in the region, atmosphere circulation characteristics, back-trajectories calculations and GNIP data. Possible mechanisms of precipitation and ice core isotopic composition in the Caucasus were derived. These results will be used for interpretation of the isotopic composition data from the bottom part of the deep ice core.