

Verification of crystal size and water stable isotopes for climatic proxies in Belukha ice core, Siberian Altai

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The seasonal change of crystal size is utilized for deriving age scale for Belukha ice core, Siberian Altai. Consequently, the upper 154.27 m of the ice core cover the period from 1210 to 2003. Annual median of initial crystal area removed impurities effect (effective crystal area) estimated by the empirical formulas shows significant correlations with air temperature estimated Barnaul temperature. The periods of small effective crystal area agree with the periods of solar activity Minimums. The 5-year averaged oxygen isotope ratio, solar modulation, accumulation and $\delta^{18}O$ excess shows significant correlations. These relationships suggest that oxygen isotope ratio in Belukha ice core represents summer precipitation changes from the Atlantic Ocean and the irradiated solar reduce precipitation. The variation of $\delta^{18}O$ excess means the ratio of precipitation from western recycled water vapor.

Keywords: ice core, crystal size, water stable isotopes, $\delta^{18}O$ -excess