



Post depositional change in isotopic composition of snow by sublimation

S.A. Sokratov, V.N. Golubev, A.V. Shishkov, V.N. Konishchev, D.M. Frolov
Faculty of Geography, Moscow State University, Moscow, Russia (sokratov@geol.msu.ru)

At present time, the isotopic data from various sources is considered to be a valuable tool for understanding climate evolution. For the Northern Hemisphere, the most developed paleo-climate reconstructions are related to the Greenland ice cores isotopic data. For the territory of Eurasia, where glaciers containing long-term paleo records are very limited, the palaeo-climate data is mainly provided by palynological or cryolithological analyses. And in here researchers face evident problems in comparing the results provided by different types of data obtained by different methods: palynological methods give summer temperatures, whereas glaciers normally account for winter or all seasons conditions. Moreover, being in reasonable agreement with the Greenland data from the same time periods, the cryolithological and palynological methods suggests 5°C lower paleo-temperatures for Sartan cold stage than the direct use of the isotopic thermometer based on ice wedges isotopic data. The suggested explanation for the discrepancy is the post depositional change of isotopic content of seasonal snow cover, varying in dependence on temperature and amount of precipitation. The dependencies relating these parameters with isotopic content of snow cover are developed. The effect of evaporation from snow surface on snow isotopic content is checked in laboratory experiments. The results of the study can also be applied to adjusting the glaciers isotopic profiles where similar processes have to take place as well. The study is supported by joint Russian Fund of Basic Research and Chinese Academy of Natural sciences grant 05-05-39011-GFEN-a.