Geophysical Research Abstracts, Vol. 7, 03305, 2005 SRef-ID: 1607-7962/gra/EGU05-A-03305 © European Geosciences Union 2005



## Oxygen isotope variability in snow from western Dronning Maud Land, Antarctica and its relation to temperature

**M.M. Helsen** (1), R.S.W. van de Wal (1), M.R. van den Broeke (1), D. van As (1), H.A.J. Meijer (2) and C.H. Reijmer (1)

(1) Institute for Marine and Atmospheric research, Utrecht University, the Netherlands; (2) Centre for Isotope Research, Groningen University, the Netherlands

This paper presents  $\delta^{18}$ O records from snow pits from four locations in Dronning Maud Land, Antarctica that contain at least four annual cycles. The aim of the study was to analyse these records as well as the prevailing temperatures during accumulation in detail, to infer to what extent isotopic composition in this area can be interpreted as temperature information. The original seasonal amplitudes of the isotope records were reconstructed by use of a simple back-diffusion model. Automatic weather station data were used to describe the accumulation history and the near-surface temperatures; the temperatures at the atmospheric level of snow formation were inferred from a regional climate model. The results show that the strongly intermittent nature of the accumulation in this area can result in the exclusion of entire seasons from the isotope records. The temperature records also reveal that the oxygen isotope records in these snow pits are biased towards higher temperatures, since snowfall conditions are associated with higher temperatures. This effect is greatest at low temperatures. A comparison between the seasonal extreme isotopic and temperature values points out that on timescales of seasons to several years, isotopic variability cannot be interpreted with confidence as temperature changes at the accumulation sites.