Geophysical Research Abstracts, Vol. 7, 09436, 2005
SRef-ID: 1607-7962/gra/EGU05-A-09436

A model study on the effect of the accumulation history on chemical tracers measured in ice cores from the Antarctic Peninsula

[1]**Van Lipzig, N.P.M.** [2]R. Mulvaney, [2]J.C. King

[1]Meteorological Institute University Munich, Munich, Germany; [2]British Antarctic Survey, Cambridge, United Kingdom. (nicole@meteo.physik.uni-muenchen.de)

Ice cores from the Antarctic Peninsula (AP) provide an important source of information on the climate variability in this region throughout the Holocene. This is relevant to put recent observed changes in the context of the longer-term climate record. However, the concentration of chemical species or isotope ratios in the cores is not uniquely determined by the atmospheric load. The accumulation history, which is often ignored due to lack of measurements, is one of the factors that might play a role. The goal of this work is to improve our understanding of the ice core records through enhanced understanding of the regional meteorology. For this, we use a time series of meteorological conditions for the period 1987-1993, as derived from a regional atmospheric model (RACMO) at 14 km resolution and realistically driven from the lateral boundaries. The model gives a good representation of the net accumulation variations at the drilling sites in the AP. In the presentation it will be highlighted that the retrieval of information from AP cores has some advantages and some disadvantages. On one hand, there are factors that complicate the interpretation of ice cores from the AP, namely; i) the correlation length for precipitation is small especially at the sites Dolleman Island and Berkner Island and ii) the orography of the region is complex and local effects play a large role. On the other hand, there are factors that make the interpretation more straightforeward than at lower accumulation sites, namely; i) there are a large number of precipitation events so information is sampled in the core more evenly during the year and ii) the high values for the accumulation in this region implies that dry depostion is not very important. Examples will be given to illustrate these advantages and disadvantages.