Geophysical Research Abstracts, Vol. 8, 01748, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01748

Spatial variations of snow accumulation in the coastal Dronning Maud Land, Antarctica

E. Kanto (1), J. Ahola (2), H. Koivula (2), T. Martma (3) and E. Sonninen (4)

(1) Division of Geophysics, Department of Physical Sciences, University of Helsinki, Finland, (2) Finnish Geodetic Institute, Finland, (3) Laboratory of Isotope Palaeoclimatology, Institute of Geology, Tallinn University of Technology, Estonia, (4) Dating Laboratory, University of Helsinki, Finland (eija.kanto@helsinki.fi)

The Antarctic ice sheet is an important component of the climate system. Taking into account the vast size of the Antarctic ice sheet it is important to extend considerably the investigation of the distribution of accumulation. In the present study we have obtained annual accumulation rates over last decade and to study the small-scale spatial variations in accumulation along a 300 km long transect in the coastal locations of western Dronning Maud Land. The data have been collected during the austral summer 2003/2004 as a part of Finnish Antarctic Research Program (FINNARP). In total 20 1-m snow pits were dug and samples for oxygen isotope ratio (δ^{18}O) were collected in 4-cm intervals. Three shallow firn cores (8-10 m) were drilled in the area. Near the Finnish research station Aboa (73˚03'S, 13˚24'W) there was a 5-km accumulation stake line of 29 stakes. On the ice shelf the accumulation rates were quite uniform but the variation was stronger after the first coastal mountain range and increased towards the second coastal mountain range. Based on the snow pits the mean accumulation was 307$\pm$13 mm w.e. on the ice shelf and 214$\pm$44 mm w.e. southward from the grounding line. The spatial variations of accumulation within 100*100 meter areas were between 4-11%. Shallow firn cores gave distinctly higher accumulation values than snow pits and this reveals the difficulties to determine the firn core data accurately. Locally near Aboa the mean accumulation was 209$\pm$124 mm w.e. and the maximum velocity of ice sheet is about 5 m a^{-1} to southwest. The contribution of sublimation could be significant near coast during the summer. The repeated measurements near Aboa during the season 2003/2004 showed that the net ablation was 79$\pm$24 mm w.e.