Geophysical Research Abstracts
Vol. 12, EGU2010-13115, 2010
EGU General Assembly 2010

Precipitation weighting dominates inter-annual variability of stable water isotopes in Greenland ice cores

Asbjørn Persson, Peter Langen, and Peter Ditlevsen
Niels Bohr Institute, Centre for Ice and Climate, Copenhagen Ø, Denmark (asbjrn@gfy.ku.dk)

The effect of variable accumulation rates on records of stable water isotopes is analyzed using atmospheric reanalysis data. Particularly in northern Greenland, seasonal scale variability in precipitation is found to destroy the relationship on annual to decadal time-scales between temperature and precipitation weighted temperatures and thereby the isotopic values. A statistical model is developed to give a quantitative description of the conditions necessary to maintain the relation. The model predicts the interannual variability of isotopic values extracted from Greenlandic ice cores reasonably well, suggesting that this variability is primarily determined by the variability of seasonal precipitation.