Geophysical Research Abstracts
Vol. 14, EGU2012-2510, 2012
EGU General Assembly 2012

Deformation and folds of the basal ice under the Greenland ice sheet

D. Dahl-Jensen (1), P. Gogineni (2), J. Paden (2), C. Leuschen (2), S. Kipfstuhl (3), M. Montagnat (4), and E. Waddington (5)

(1) University of Copenhagen, Niels Bohr Institute, Copenhagen, Denmark (ddj@gfy.ku.dk), (2) Center for Remote Sensing of Ice Sheets , 2335 Irving Hill Rd, Lawrence, KS 66045, ¬¬USA, (3) Alfred Wegener Institute, Columbusstrasse, D-27568 Bremerhaven, D , (4) Laboratoire de Glaciologie et de Géophysique de l'Environnement, 54, Rue Molière, Domaine Universitaire, BP 96, 38402 Saint Martin d'Hères Cedex, France, (5) Department of Earth and Space Sciences, University of Washington, Johnson Hall Rm-070, Box 351310, 4000 15th Avenue NE, USA

Improvement of the depth sounding radio echo sounding over Greenland Ice Sheet has made it possible to map the near basal layers that have not been 'seen' earlier due to the very high demand of attenuation needed to reach through more than 3000m of ice.

The basal 10% of the ice thickness reveals very disturbed layering in the central and north parts of the Greenland ice sheet. The onset of the disturbances very often seem to coincide with the ice from the climatic inception from the Eemian period to the Last Glacial period around 115.000 years before present.

Studies of the ice rheology reveals big changes of ice crystal size and orientation at this boundary caused by big contrast of impurity concentrations in the ice from the warm and cold climatic periods. The warm ice from the Eemian (130.000 years – 115.000 years b2k) seems to behave as a big rather hard layer in the ice with the easier deformable glacial ice above and below.

Examples of the ice folds from CReSIS radio echo images especially from the NASA ICEBRIDGE spring 2011 campaign over Greenland is shown together with ice rheology studies from the GRIP, NGRIP and NEEM ice cores.