



## **A new 60,000 year Greenland stratigraphic ice core chronology**

Anders Svensson (1), Katrine K. Andersen (1), Matthias Bigler (1), Henrik B. Clausen (1), Dorthe Dahl-Jensen (1), Sigfus J. Johnsen (1), Sune O. Rasmussen (1), Regine Röthlisberger (2), Jørgen Peder Steffensen (1), and Bo M. Vinther (1)

(1) Ice and Climate Research, Niels Bohr Institute, University of Copenhagen, Denmark (as@gfy.ku.dk) (2) British Antarctic Survey, High Cross, Madingley Road, Cambridge, CB3 0ET, UK

The Greenland Ice Core Chronology 2005 (GICC05) is a new stratigraphic time scale covering the full period from present day back to 60 ka b2k (before AD 2000). Whereas the Holocene part of the time scale is based on various records from the DYE-3, the GRIP, and the NorthGRIP ice cores, the glacial part is solely based on annual layer counting of high-resolution records from the NorthGRIP ice core. A conservative uncertainty estimate of the time scale is obtained from identification of ‘uncertain’ annual layers, which are counted as  $0.5 \pm 0.5$  years. On average the uncertainty is  $< 1\%$  during the Holocene and  $\sim 5\%$  in the glacial. Uncertainties are quoted as the sum of uncertain annual layers (the maximum counting error) which can be regarded as a 2-sigma error.

GICC05 places the Holocene/Pleistocene transition at  $11.70 \pm 0.10$  ka b2k, the center of the Laschamp  $^{10}\text{Be}$  maximum in Greenland Interstadial 10 (GI-10) at  $41.3 \pm 1.6$  ka, and the North Atlantic Ash Zone 2 layer in GI-15 at  $55.4 \pm 2.4$  ka. Back to 40 ka GICC05 agrees generally well with the GISP2 time scale of Meese-Sowers, but beyond 40 ka there is a discrepancy of more than 2 ka. At the onset of GI-3 there is a  $> 1$  ka disagreement with the Shackleton-Fairbanks GRIP time scale (SFCP04) based on  $^{14}\text{C}$  calibration of a marine core. GICC05 compares well to the Hulu Cave record with absolute age differences within 800 years throughout the 60 ka period. Around 55 ka there is a very good match to the Kleegruben speleothem record from the Austrian Alps.