Geophysical Research Abstracts, Vol. 9, 00907, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00907

Introducing the concept of low-angle grain boundaries in ice core crystallographic studies: towards a more precise material characterization

D. Samyn and G. Durand

(1) Laboratoire de Glaciologie, Université Libre de Bruxelles, Belgium, (2) Glaciology group, Niels-Bohr Institute, University of Copenhagen, Denmark

Grain boundaries are defined in crystallography as delimiting material domains with homogeneous composition and lattice arrangement (crystallites). Characterizing the spatial dimensions and lattice orientation of these crystallites has allowed significant improvement in understanding the flow behaviour of polycrystals in material and geosciences. Automatic crystallographic analysers developed over recent years, in association with numerical processing, have further increased the quality and quantity of data available. Here we introduce the notion of low-angle grain boundaries (LAGB) to the study of ice with the view to refine textural analysis and dynamic interpretation from ice cores. LAGB processing is incorporated into the Texture Toolbox (Durand et al., 2006), in which each boundary is treated through image analysis and is assigned a specific rotation matrix. Sub-boundaries can be investigated in this way and, hence, information on recrystallization mechanisms and palaeo-stress can be gained. The method and its benefits are illustrated through different case studies.