Geophysical Research Abstracts, Vol. 8, 03455, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03455

Large-scale ice-sheet oscillations – mechanism, modelling, intercomparison

R. Calov (1), R. Greve (2)

(1) Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany, (2) Institute of Low Temperature Science, Hokkaido University, Sapporo, Japan (calov@pik-potsdam.de / Fax: +49-331-288-2570)

Understanding of large-scale ice-sheet oscillations is important, because they are closely related to Heinrich events, which belong to the most prominent phenomena of the past climate. We review explanations of the mechanism determining self-sustained oscillations of ice sheets and give an overview on ice-sheets models which show such cycles. The main mechanism of an oscillations cycle (or Heinrich cycle) are an upstream expansion of temperate basal area, the actual surge event, a downstream back-migration of temperate basal area and the slow recovering of the ice sheet through snowfall.

An intercomparison project on self-sustained ice-sheet oscillations is introduced. The research questions of this project are summarised as follows. Are there self-sustained oscillations in the given ice-sheet model, and under which circumstances do they appear? How long does a surge event last and how long is the recurrence time between events? Are the events periodical or quasi-periodical? How large are the changes in ice volume, ice thickness, homologous basal temperature and basal temperate area? How do the ice-surface elevation, homologous basal temperature, sliding and surface velocity look like at certain time slices before, during and after the events?