The ISMIP HEINO project: Intercomparison of large-scale oscillations in ice-sheet models

Reinhard Calov (1), Ralf Greve (2), ISMIP HEINO Intercomparison Group (*)

HEINO Heinrich Event INtercOmparison, under the umbrella of ISMIP (Ice Sheet Modelling Intercomparison Project), investigates self-sustained large-scale oscillations (Heinrich Events, HEs) in ten different ice-sheet models. Here, we will present the final analysis of the results of the HEINO intercomparison project. The problem consists of a flat square with 4000 km side length. This square contains an area resembling Hudson Bay and Hudson Strait, on which rapid sediment sliding can occur. The ice sheet is built up over 200,000 years by assuming temporally constant glacial climate conditions (detailed description at http://www.pik-potsdam.de/~calov/heino.html). The majority of the ice-sheet models (eight of ten) reproduce HEs. Although there are differences in surge amplitude, duration and recurrence time, the intercomparison shows a number of features which all models have in common.

(1) Potsdam Institute for Climate Impact Research, Potsdam, Germany, (2) Institute of Low Temperature Science, Hokkaido University, Sapporo, Japan, (*) Philippe Huybrechts (Department of Geography, Vrije Universiteit Brussel, Brussels, Belgium), Ed Bueler (Department of Mathematics and Statistics, University of Alaska, Fairbanks, AK, USA), Catherine Ritz (Laboratory of Glaciology and Environmental Geophysics, Saint Martin d’Heres, France), David Pollard (EMS Earth and Environmental Systems Institute, Pennsylvania State University, University Park, USA), Frank Pattyn (Laboratory of Glaciology, Department of Earth and Environmental Sciences, Universite Libre de Bruxelles, Brussels, Belgium), Lev Tarasov (Department of Physics and Physical Oceanography, Memorial University of Newfoundland, St. Johns, Canada), Jesse V. Johnson (Department of Computer Science, University of Montana, Missoula, USA), Fuyuki Saito (Frontier Research Center for Global Change, Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan), Ayako Abe-Ouchi (Center for Climate System Research, University of Tokyo, Kashiwa, Japan)