SIMULATION OF THE LAST GLACIAL CYCLE WITH A CLIMATE-SYSTEM MODEL

R. Calov and A. Ganopolski

Potsdam Institute for Climate Impact Research,Potsdam, D-14412 Germany

We present simulations of the Northern Hemisphere inland ice through the last glacial cycle using the climate-system model CLIMBER-2 which is coupled with the 3-D ice-sheet model SICOPOLIS. CLIMBER-2 is a low resolution model of intermediate complexity which describes the atmosphere, sea ice, ocean, and the biosphere. SICOPOLIS simulates the thickness, velocity, temperature and water-content for grounded ice sheets. SICOPOLIS provides CLIMBER-2 with the temporal change of orography and areas of land and ice sheets. Inversely, the climate characteristics (air temperature and humidity, long-wave and short-wave radiation, precipitation) on the coarse grid of CLIMBER-2 are used to calculate the energy and mass balance on the fine grid of SICOPOLIS accounting for orography. The only external forcing for CLIMBER-2 are the Milankovitch insolation and the atmospheric CO_2-concentration. We investigate the role of different feedback mechanism of the climate system for glacial inception. It is shown that the atmospheric dust and the sliding of ice over sediment are important for the evolution of the inland ice during the last glacial cycle.