Results of the Greenland ice sheet model initialisation experiments: ISMIP6 – initMIP-Greenland

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Ice sheet model initialisation has a large effect on projected future sea-level contributions and gives rise to important uncertainties. The goal of this intercomparison exercise for the continental-scale Greenland ice sheet is therefore to compare, evaluate and improve the initialisation techniques used in the ice sheet modelling community. The initMIP-Greenland project is the first in a series of ice sheet model intercomparison activities within ISMIP6 (Ice Sheet Model Intercomparison Project for CMIP6). The experimental set-up has been designed to allow comparison of the initial present-day state of the Greenland ice sheet between participating models and against observations. Furthermore, the initial states are tested with two schematic forward experiments to evaluate the initialisation in terms of model drift (forward run without any forcing) and response to a large perturbation (prescribed surface mass balance anomaly). We present and discuss results that highlight the wide diversity of data sets, boundary conditions and initialisation techniques used in the community to generate initial states of the Greenland ice sheet.