

Modelling concepts of the Jakobshavn Isbrae and the Greenland Ice Sheet at AWI

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We will present modeling plans of the AWI ice modeling group for the Greenland Ice Sheet and the Jakobshavn Isbrae. The aim of the modeling is to determine the causes for the acceleration of the outlet glacier and potential stabilizing feedback mechanism, as well as to establish projections of the contribution of the Greenland Ice Sheet to sea level change. In general, we are using a multi-physics hybrid-scale approach to model entire ice sheets with regional refinement in full-Stokes in order to capture grounding line migration adequately. For both applications, the Jakobshavn Isbrae as a stand-alone regional study, as well as the entire ice sheet, we use unstructured grids and apply ISSM. In this presentation we show preliminary results of the Jakobshavn Isbrae and the concept with which we plan to test the current hypothesis for the acceleration of this outlet glacier. Furthermore, we discuss critical issues and advantages concerning the full Stokes modeling as an outcome of studies we have performed using COMIce and TIMFD3, both full Stokes models in FE and FD, respectively.