

Modeling Abrupt Change in Global Sea Level due to Ocean–Ice-sheet Interaction

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The long time scale of ice internal to the Greenlandic and Antarctic ice sheets suggests that any rapid sea level change will be due to faster processes at the margins of the great ice sheets. In particular, mass loss and thinning at outlet glaciers and ice shelves due to contact with the ocean may be significant. This poster describes ongoing work to couple a depth-integrated sub-shelf melt-water plume model to an ice model (GLIMMER/CISM) in order to understand the relation between the internal dynamics of an ice shelf and the melting (or freezing) that occurs at its lower boundary. Specifically, we are looking for a mechanism by which melt-water plumes may form and sustain longitudinal or transverse channels in a shelf.