

Incorporation of grounding line parameterizations in the three-dimensional ice sheet model SICOPOLIS

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Understanding the nature, stability and climatic thresholds of the Antarctic ice sheet is important for projecting future sea level change. Flow of Antarctic ice sheet is commonly represented with Shallow Ice Approximation (SIA) and Shallow Shelf Approximation (SSA). However, under coarse horizontal resolution (~10km) that is feasible for long-term simulation of Antarctic ice sheet of glacial cycles, combined SIA/SSA model has limited utility in the migration of grounding lines (Pattyn et al. 2012). Recent Antarctic Ice Sheet models utilize sub-grid parameterization of grounding line migrations to represent large-scale grounding line migration of Antarctic marine ice sheets during glacial cycles. Here, a sub-grid grounding line parameterization is incorporated to the 3-dimensional ice sheet model SICOPOLIS. We present the results of model evaluations under both of idealized topography and realistic Antarctic topography.

Keywords: Antarctic ice sheet, ice sheet model