

## Recent development of numerical ice-sheet/ice-shelf model IcIES and its application on Antarctic Ice Sheet

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Ice sheet model for Integrated Earth-system Studies (IcIES) has been developed to simulate Greenland and Antarctic ice sheets as well as paleo-climate studies of past Northern Hemisphere ice sheets.

Previous studies using old version of IcIES for the Antarctic ice-sheets have focused on subjects which are insensitive to transient migration of grounding line position. Now we have been restructuring and improving the model to compute flow fields over ice-shelf and on grounding line using the shallow-shelf approximation and a grounding-line flux parameterization (based on Schoof 2007), for better understanding of past/future evolution of ice sheets. In this study details of recent structure of the numerical model is described. Demonstration under ideal and realistic configuration including Greenland and Antarctic ice sheets are presented. Impact on the simulation by variation of technical details such as a convergence criteria in the matrix solver is described to show the influence of long-term simulations.

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