



MISMIP: Marine Ice Sheet Model Intercomparison Project Results

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Resolving the dynamics of marine ice sheets numerically has posed considerable problems in the past. Using recently derived semi-analytical steady-state results as a benchmark, we compare results for a set of standardized experiments computed using a number of different models and discretization techniques. In particular, we compare the performance of models under advance and retreat scenarios, and whether they capture certain ‘tipping points’ — or bifurcations — predicted by the benchmark results. We find that high grid resolution near the grounding line is essential, but even given that caveat, model behaviour can depend significantly on the details of discretization, in particular on how the flotation criterion for transition from grounded ice, which experiences basal friction, to floating ice, which does not, is handled by a particular model code. We also discuss possible choice of models for large-scale simulation of marine ice sheets.