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# Improved Discretization of Grounding Lines and Calving Fronts using an Embedded-Boundary Approach in BISICLES

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Correctly representing grounding line and calving-front dynamics is of fundamental importance in modeling marine ice sheets, since the configuration of these interfaces exerts a controlling influence on the dynamics of the ice sheet. Traditional ice sheet models have struggled to correctly represent these regions without very high spatial resolution. We have developed a front-tracking discretization for grounding lines and calving fronts based on the Chombo embedded-boundary cut-cell framework. This promises better representation of these interfaces vs. a traditional stair-step discretization on Cartesian meshes like those currently used in the block-structured AMR BISICLES code. The dynamic adaptivity of the BISICLES model complements the subgrid-scale discretizations of this scheme, producing a robust approach for tracking the evolution of these interfaces. Also, the fundamental discontinuous nature of flow across grounding lines is respected by mathematically treating it as a material phase change. We present examples of this approach to demonstrate its effectiveness.