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Coupled ice-ocean modelling of the Amundsen Sea glaciers

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Glaciers in the Pacific sector of West Antarctica are losing mass at an accelerating rate. Superimposed on this long-term trend are interannual variations in mass balance that result from a combination of internal ice dynamics and variability in ocean-induced ice shelf melt rates. We explore the relative importance of these internal and external drivers of change, using a newly developed coupling between the 3D ocean model MITgcm, and the SSA ice flow model Úa. For present-day ocean conditions, we simulate persistent retreat of the Pine Island, Thwaites, Smith and Kohler grounding lines between 2020 and 2150. We demonstrate complex changes in ice shelf melt rates caused by the evolving cavity geometries.