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Hysteresis of the Antarctic Ice Sheet

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Holding more than half of Earth's freshwater at present, the Antarctic Ice Sheet is by far the largest source of future sea-level rise with a potential of raising the mean elevation of the oceans by nearly 60 meters globally. Despite comparably low rates of Antarctic sea-level contribution at present, this poses a serious threat to coastal populations and ecosystems on centennial and millennial time scales under global warming. Yet, large uncertainties flaw our knowledge of Antarctica's long-term stability and future behavior—among them a lack of quantification of Antarctic tipping points.
Using the thermomechanically-coupled shallow ice model PISM, we investigate critical thresholds in global mean temperature for the Antarctic ice basins, and present the continental ice-sheet hysteresis.