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## Is West-Antarctica's Tipping Point a Fixed Value?

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Given large regions of ice grounded below sea level associated with a retrograde bedrock, the West Antarctic Ice Sheet (WAIS) is believed to be a tipping element whose tipping point could be reached within this century under high emission scenarios. As the WAIS represents the largest and most uncertain source of future sea-level rise, characterising its stability is crucial for defining safe emission pathways and protecting livelihoods in coastal regions. In the present work, we investigate its potential to undergo an abrupt change due to a fold bifurcation. To this end, we use a high-order ice sheet model with 16km spatial resolution. Rather than applying a fixed forcing rate as in previous studies, we apply a forcing scheme that adaptively increases the local temperature while keeping the system near equilibrium, which allows us to obtain a rigorous value for the bifurcation tipping point. More importantly, we show how this threshold can become relevant for much lower warming levels than expected - even within the bounds of relatively conservative emission scenarios. Subsequently, we explain the underlying mechanisms leading the marine ice-sheet instability to possibly arise earlier than suggested by the bifurcation study. We finally question whether the tipping point of the WAIS can be understood as a fixed temperature value and if not, by which information it should be extended to provide an early warning signal.