



## **Bedmap2 uncertainty and past ice sheet stability**

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The recently published Bedmap2 Antarctic bed elevation data have uncertainties exceeding 1 km in certain regions. Variations in this important boundary condition can have a large impact on simulations of the stability of the Antarctic ice sheets, in particular for regions where the bed is below sea level and bordering the ocean. Here we investigate how modern bed elevation uncertainty affects ice sheet model simulations for a generic warm Pliocene climate, a period in the past when there is evidence for large-scale retreat of both the West and East Antarctic ice sheets.

We perform an ensemble of simulations with random topographic noise added with various length scales and with amplitudes tuned to the uncertainty of the Bedmap2 dataset. The ice sheet model used includes new mechanisms for enhanced ice shelf calving and an ice cliff failure mechanism. Total Antarctic ice sheet retreat varies by over 7 m (sea level equivalent) between these different simulations. This study highlights the sensitivity of ice sheet models to existing uncertainties in bed elevation.