



## **Minimising model drift in initialisations of Antarctic ice-sheet models**

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Model initialisation is a key element in providing future projections of ice sheet mass change, as demonstrated by various model intercomparisons (InitMIP Greenland and Antarctica; Goelzer et al., 2018; Seroussi et al., submitted). Several methods exist for this purpose, and their use depends on the time scales considered. Here we analyse an iterative method that dynamically updates the basal friction field for marine ice sheets and ice shelves (Pollard and DeConto, 2012; Pattyn, 2017; Bernales et al., 2017) by reducing the misfit between observed and modelled ice thickness. While the method may be time consuming when using hybrid SSA-SIA models, we explore methods to iteratively reduce misfits starting from SIA estimates and progressively including higher-order stress gradients. Furthermore, several methods are tested to reduce model drift once the grounding line is allowed to migrate freely after initialization. The methodology is tested for different spatial resolutions.