



New basal temperature and basal melt rate maps of Antarctica

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Ice sheet basal conditions are key to initialize ice flow models and be able to estimate the future of the cryosphere. The thermal conditions are of importance because of the widespread presence of water beneath the Antarctic continent that affects both the ice-dynamics and the mass budget. The melting or freezing at the base of the ice sheet is consequence of several contributions to the heat balance. This includes the geothermal heat flux, the heat conducted or advected through the ice sheet, the latent heat and the friction heat at the interface.

Here we present a new basal temperature and a total basal melting rate distributions of Antarctica. For this we use the most recent heat flux map (Martos et al., 2016) and an advanced ice flow model to incorporate the effect of advection and estimate frictional heat. We assume steady state conditions to estimate the basal properties. We found higher basal melting rates in West Antarctica than in East Antarctica as well as in the coastal regions of the continent and ice shelves. The spatial variation of our new basal temperature and basal melting rate distributions are greater than previously proposed which will help to unveil the Antarctic subglacial hydrology.