



The response of Greenland ice sheet model to a new geothermal heat flux estimate

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One of the most important, but poorly known, boundary conditions for large scale ice sheet models is the geothermal heat flux beneath the ice caps. The geothermal heat flux influences both the thermal regime and the dynamics of the ice sheets. Until now, ice sheet models have been run with either constant geothermal heat flux, or estimates based on a few borehole measurements. Recently, estimates of the geographically varying geothermal heat flux have been made from magnetic field models based on satellite magnetic data. The latest estimate has a band of higher geothermal heat flux from the the central eastern part of Greenland across towards west and south, with highest values in the eastern part. Lowest values are in the northwestern part of Greenland. We apply this new boundary condition with the ice sheet model SICOPOLIS for the Greenland ice sheet. Comparison with previous results for the basal temperature distribution and ice sheet thickness is done, and the sensitivity of model results to variation in the geothermal heat flux is assessed.