Uncertainty in Greenland glacial isostatic adjustment

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TITLE: Uncertainty in Greenland glacial isostatic adjustment *(Invited)*

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ABSTRACT BODY: It is well known that the interpretation of geodetic data in Greenland to constrain recent ice mass changes requires knowledge of isostatic land motion associated with past changes in the ice sheet. In this talk we will consider a variety of factors that limit how well the signal due to past mass changes (commonly referred to as glacial isostatic adjustment (GIA)) can be defined. Predictions based on a new model of Greenland GIA will be shown. Using these predictions as a reference, we will consider the influence of plausible variations in some key aspects of both the Earth and ice load components of the GIA model on predictions of land motion and gravity changes. The sensitivity of model output to plausible variations in both depth-dependent and lateral viscosity structure will be considered. With respect to the ice model, we will compare the relative contributions of loading during key periods of the ice history with a focus on the past few thousand years. In particular, we will show predictions of contemporary land motion and gravity changes due to loading changes following the Little Ice Age computed using a new reconstruction of ice thickness changes based largely on empirical data. A primary contribution of this work will be the identification of dominant sources of uncertainty in current models of Greenland GIA and the regions most significantly affected by this uncertainty.

KEYWORDS: 1225 GEODESY AND GRAVITY Global change from geodesy, 0726 CRYOSPHERE Ice sheets.

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