



## **Glacial isostatic adjustment in Fennoscandia and the inference of the 3D mantle structure in Northern Europe from GRACE data**

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The ongoing response of the Earth to the glacial and deglacial events of the last Ice Age, the so-called the Glacial Isostatic Adjustment (GIA) process, is a common phenomenon in North America and Fennoscandia. Knowledge of the GIA process allows us to understand mantle rheology and dynamics, ice sheet thickness history and climate change. Recently, analysis of data of the Gravity Recovery and Climate Experiment (GRACE) satellite mission allows us to identify long-term GIA mass changes in North America and Fennoscandia. As there are now more than 7 years of data available, the determined trends of these mass changes are robust enough for the inference of the viscosity structure of the Earth's mantle.

In this study we focus on the Fennoscandian rebound area. In a first step, GRACE data are taken to fix the radial (1D) viscosity profile and the lithospheric thickness, which are needed as background parameters for 3D earth modeling. The results agree well to former works using relative sea-level and GPS data. In the same way, we test different ice models (ICE-3G, ICE-4G, ICE-5G, RSES) used in the GIA modeling. In a second step, GRACE data help to constrain the 3D viscosity profile, which is currently used in 3D spherical FE modeling. We assign the best 1D results as background profile and also the most reliable ice models from the 1D investigation.

Our results show that GRACE data represent another dataset that can be successfully used in GIA investigations. In turn, our results help to solve GRACE-related questions such as identification of the most adequate filter technique in GRACE-based GIA investigations and of the best reduction method for hydrological mass change signals.