Postglacial rebound in Estonia: Constraints from the measurements of Estonian geodetic networks

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Noticeable crustal movements in Estonia result mainly from the postglacial rebound (PGR) of Northern Europe. PGR has a clear impact on the establishment and the maintenance of national geodetic networks because geodetic coordinates, gravity and geoid surface vary continuously in time. In Estonia, geological and sea level data, repeated levelling and gravity measurements are available for the determination of vertical crustal movements and for the study of the glacioisostatic processes inside Earth.

In this work temporal gravity variations were estimated on the basis of precise gravimetric data measured repeatedly on the gravity network of Estonia. Those variations correlate well with the pattern of crustal movements and the time-series of sea level data. Observed variations have also been verified by the predictions of PGR models. Discrepancies between observations and predictions indicate measurement errors as well as the poor constraining of PGR models in Eastern Europe.