

Present-day mass variations in Fennoscandia as determined from joint analysis of absolute gravity and GRACE data

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Since 2002 the GRACE satellite mission provides monthly solutions of the Earth's gravity field reflecting mass variations on various spatial and temporal scales. The GIA-induced trend signal in Fennoscandia can be obtained with a spatial resolution of about 300 km.

Moreover, since 2003 our institute has carried out absolute gravity (AG) measurements in Fennoscandia in close cooperation with the Scandinavian partners. From the AG data, point-wise mass variations at the AG sites have been determined which also contain possible local mass signals, in addition to the GIA-induced trend. For direct comparison of those point values with surface results from GRACE, vertical movements of the sites have to be considered using rates determined from permanent GPS measurements. The various results for GIA-related effects agree very well, although the different data contain different signal contributions.

In a final step, we combine the AG trend values (including GPS rates) and the GRACE results to end up with a purely data based solution of the present-day secular mass variation in Fennoscandia. Here, we present results of the single techniques also well as the combined solution, where we also discuss possible errors sources.