



## **Alps uplift dynamic gravity signal**

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The Alpine and neighboring Dinarides and Appennine orogens are subject to uplift, as documented by the GNSS vertical movement rates. The uplift is caused by crustal compression and thickening and/or mantle inflow below an uplifting crust. The two end-members can be distinguished by the amount of gravity change rate, the thickening having a smaller gravity signal than the crustal uplift, because the mass surplus at the surface is compensated at the level of lower crust. We calculate the expected rates using the observed GNSS determined uplift rates as geometrical surface constraints, and defining the two end-member geodynamic models. We analyze the gravity change rates of GOCE and GRACE and compare them with the expected rates. Hydrology must be considered in this context, as it contributes to a competing gravity change rate signal that is superposed to the tectonic signal. We find that the predicted signal is measurable, and that lateral changes in the sign of the observed gravity rates over the Alpine range have no counterpart in the ongoing uplift. We analyze possible candidates for this latter signal.