



A study on the Austrian Moho from GOCE data

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One of the main objectives of the European Space Agency (ESA) mission GOCE is to improve our understanding of the physics of the Earth's interior and in particular to investigate new insights into processes occurring in the lithosphere and upper mantle.

In this framework different algorithms has been proposed to estimate the boundary between the Earth's crust and the mantle (Mohorovičić discontinuity or Moho) from GOCE data. Our solution is based on Fourier analysis and Wiener deconvolution of local grids of gravitational potential and its second radial derivative at mean satellite altitude. In order to apply the Fourier transform a convolution structure of the observation equations has to be guaranteed by making proper approximations on the geometry of the problem (e.g. planar approximation). Moreover a proper bording region around the considered area is necessary to get accurate results.

In the present work a numerical experiment for the Moho estimation under the Austrian region based on the first months of GOCE data has been performed. The main characteristic of this preliminary GOCE-only Moho model is that it is analytically computed from a uniform dataset, thus avoiding the uncertainties of seismic profile interpretation.

Different approximations (planar and almost spherical) have been adopted to preserve the convolution structure of the observation equations, evaluating their impact on the final solution. The optimal dimension of the bording region has been studied as well. Despite the simplistic hypotheses the Moho has been estimated with a resolution of about 250 km and an accuracy of the order of few kilometers.