



GEMMA2.0: an improved global crustal model based on GOCE data

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The usefulness of GOCE gravity field observations for the study of the Earth crust at global scale is nowadays well known: from the one hand they give a constraint to verify global crustal model, from the other hand combining gravity observations with seismic data and considering additional hypotheses on the structure of the lithosphere it is possible to retrieve not only the Moho depth, but also important information on the Earth crust density. The latter point has been deeply studied in the GEMMA project (GOCE Exploitation for Moho Modeling and Application), funded by ESA-STSE and ASI, where a global crustal model constrained by one year of GOCE observations has been computed.

In the present work we propose three major improvements to the GEMMA model. First of all the upper mantle model is corrected for the main subduction zones, this requires to model the geometry of the most important subducting plates, compute the corresponding gravitational signal and reduce GOCE observations accordingly. Secondly the clustering of geological provinces, required in order to properly set the mass density inside the Earth crust, is refined according to the information coming from the gravitational field itself. Finally the full GOCE dataset, complemented with other models in the polar gaps, has been used as input data.

Based on this improved dataset a new global crustal model is computed (GEMMA2.0) and compared with other existing solutions.