

JWG2.8: Modeling and Inversion of Gravity-Solid Earth Coupling

(Joint with commission 3)

Chair: Carla Braitenberg (Italy)

Terms of Reference

To model and invert gravity-solid Earth coupling, e.g. explore situations in which gravitative forces have been an important agent in the evolution of the lithosphere. The topics of interest range from the evolution of crustal thickness, isostatic Moho response, lithospheric thickness, lithospheric slab pull, lithospheric cooling, gravity field related deformation. Explore where and to what extent density variations in crust and mantle affect mass loading and geodynamics. We consider the effect of density changes in time through thermal heating and cooling, including magmatic loading, underplating and basin evolution. Methodological aspects include the development of forward and inversion algorithms in a spherical Earth, the use of the gravity tensor and the new GOCE observations. This Working Group belongs to the initiatives coordinated by Sub-Commission 2.6.

Goals

- Create a platform in which density models can be tested through geodynamic models. This needs the interaction of the geodynamic modeler with the geophysical modeler, and allows a consistency check of the density models from the point of view of observations of the potential field and of geodynamics. Viceversa the geodynamic models producing density variations are checked against consistency with density models constrained by further geophysical observations.
- Create a reference database covering the subject of gravity-solid earth coupling (mass loading, underplating, isostatic Moho, crustal thickness, lithospheric thickness, dynamic topography versus mass loading).
- Create a database on methodology of gravity forward and inversion calculations, spherical calculations
- Create a kit of software tools that have been tested and verified by the working group and that will be shared among the members of the working group. It shall cover the different aspects of the goals of the WG. If several software-programs are made available they can be benchmarked against each other.
- Set up a social networking page for the members of the working group.
- Organize a practical-theoretical school on Modeling and Inversion of Gravity-Solid Earth Coupling

Members

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