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## Integrated lithospheric modeling combining geoid undulation, elevation, and thermal distribution. A case of study: the Iberia-Africa plate boundary

J. Fullea(1), M. Fernàndez(1), H. Zeyen(2)

(1) Instituto de Ciencias de la Tierra (Jaume Almera), CSIC, 08028 Barcelona, Spain, (2) Université Paris-Sud, Département des Sciences de la Terre, 91405 Orsay, France

The geoid anomaly is related with the density structure within the Earth. The long wavelength features are associated with deep mass anomalies (core/mantle), while the very short ones correspond to uncompensated topography and lithospheric flexure. In the middle term wavelengths the geoid depends upon the mass anomalies within the lithosphere and is proportional to the first moment of the density anomaly beneath the observation point. An inversion method which takes into account the elevation and geoid undulation as well as the thermal distribution is proposed in order to resolve, at a first order, the crustal and lithospheric structure beneath the Atlantic-Mediterranean transition zone. Main assumptions in the modelling are local isostasy and a two-layered model of crust and lithospheric mantle, plus sea water and asthenosphere. For the crust, sea water and asthenosphere we assume constant densities, while for the lithospheric mantle a temperature-dependent density is considered. The effect of thermal parameters in the inversion is also investigated. The obtained results show a zone of thickened lithosphere, oriented NE-SW and located beneath the western Betics, Rif, Gibraltar Strait, the Gulf of Cadiz and the Atlantic Moroccan margin. In addition, a zone of thinned lithosphere with the same orientation is interpreted beneath the Atlas Mountains and the Alboran Sea.