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Gravity and Tectonics of the Western Mediterranean Sea

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All gravity data available for the western Mediterranean Sea and adjacent countries have been reevaluated and reprocessed into Bouguer gravity maps. Previously, onshore gravity data from the western Mediterranean Sea were not terrain corrected. With a raster of digital onshore and offshore topographic data terrain correction was carried out up to Hayford zone O₂. The largest effect of the terrain correction was found in the area of the sea-land boundary and the Balearics. The new Bouguer maps show clearly the main geological and tectonic features. Values of over 180 mGal for example are found in the Algero-Provençal Basin where the crust is probably oceanic. In the Valencia Trough on the other hand, where the crust is considered to be stretched continental, values reach only 140 mGal. The Bouguer values decrease towards the Iberian peninsula and Africa where the crust is continental.

Preliminary results of a refraction seismic experiment carried out in Autumn 1989 in the Valencia Trough and adjacent flanks confirm the Bouguer gravity interpretation. In the central part of the Valencia Trough the crust is about 15 km thick. The depth to Moho increases to approx. 25 km close to the Balearic Promontory, and 20 km towards the Iberian Peninsula. The gravity and seismic results are presented and the tectonic evolution of the area discussed.