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Crust-Mantle mechanical decoupling in the Central Mediterranean region

Raffaele Splendore and Anna Maria Marotta

Università degli Studi di Milano, Dipartimento di Scienze della Terra, Sezione di Geofisica, Milano, Italy (raffaele.splendore@unimi.it)

A thermo-rheological analysis is performed to elucidate the mechanical behaviour of the lithosphere in the Mediterranean domain. The thermal field of the lithosphere is calculated by means of a finite element thermal model. The decrease in radiogenic heat production with depth is taken into account, together with the compositional layering of the lithosphere. The predicted thermal field is analysed in terms of the temperatures and depth of the thermal lithosphere base. To validate the thermal model, a comparison with the available tomography of the Mediterranean area is performed. Based on the predicted thermal field, a rheological analysis is conducted, accounting for both the brittle and ductile behaviour of each lithospheric layer. The effects of the choice of a soft or hard mantle rheology are also investigated. Our rheological analysis emphasises how the interplay between thermal field, crust and mantle thicknesses and compositional stratification may result in local intra-plate mechanical decoupling features.