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# Instantaneous mantle dynamics of the Western Mediterranean region

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Our research is concerned with the establishment of links between deep mantle processes and surface deformation. Our main focus is on the instantaneous mantle dynamics of the European-Mediterranean region and its surface responses. Here we have constructed instantaneous 3-D dynamic models of the Western Mediterranean region with focus on subduction below Betic-Rif-Alboran region. The driving forces in the models are due to temperature variation, which is derived from seismic tomography. The tomography model, which is used in our research, is the global P-wave speed model UU-P07 (M. Amaru, PhD Thesis, Utrecht University, 2007; Van der Meer et al., Nature Geoscience, 2010). For the subducted slab in this region we have assumed a temperature profile according to the Jurassic-Early Cretaceous age of the oceanic lithosphere. The boundary conditions used in the dynamic models allow us to include constraints from motions of the larger tectonic plates regarding the convergence of African and Eurasian plates. We present the topography response and the predicted patterns of surface deformations for this region based on a number of assumptions regarding the scaling of tomography to temperature and density, and rheology. A depth and temperature dependent rheology is assumed for most of the domain. Lithosphere faults are modeled with low viscosity zones. The mesh-generating tool used enables us to have finer resolution at the scale of a few kilometers in fault zones and along plate boundaries in the area of interest.
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