



EuCRUST-07: A new reference model for investigations of mantle structure

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We present a new digital model (EuCRUST-07) for the crust of Western and Central Europe and surroundings (35°N-71°N, 25°W-35°E). Available results of seismic reflection, refraction and receiver functions studies are assembled in an integrated model at a uniform grid (15' x 15'). This model is of higher resolution and more robust than previous compilations (e.g. CRUST2.0, Bassin et al. 2000) primarily because of significant number of recent seismic data assembled (Tesauro et al., 2008). The new model offers a starting point for various types of numerical modelling to remove the crustal effect beforehand and to exclude a trade-off with mantle heterogeneities. An example of its application is offered by construction of a new gravity model of the lithosphere. The gravity effect of the new crustal model is computed and removed from the observed gravity field to get the residual mantle gravity anomalies. These anomalies reflect the effect of mantle density variations, which are induced by temperature and compositional anomalies, and by variations of the lithosphere thickness. Furthermore, EuCRUST-07 is employed to correct seismic tomography data (Koulakov et al., 2008). We used the new tomography data to get location of the lithosphere-asthenosphere boundary and temperature distribution in the lithosphere. The results obtained allow calculating a strength state of the European lithosphere. The new strength results presented here are principally improved compared to the previous ones (Cloetingh et al., 2005) by the inclusion of the effects of the lateral physical parameters variation (e.g. density and lithology) and of the new thermal model.