Geophysical Research Abstracts
Vol. 14, EGU2012-10542, 2012
EGU General Assembly 2012

Moho depth and crustal velocities from the Bosporus to S.E. Asia

W. Stolk (1,2), M. Kaban (2), F. Beekman (3), M. Tesauro (2), and S. Cloetingh (3)

(1) VU University Amsterdam, Faculty of Earth and Life Sciences, Netherlands (wstolk@vu.nl), (2) GeoForschungsZentrum Potsdam, Germany, (3) Utrecht University, Faculty of Geosciences, Netherlands

Crustal heterogeneities tend to mask underlying upper mantle heterogeneities. Therefore accurate knowledge of the crustal structure is necessary in order to investigate the deeper structures. Furthermore, the crust locally inherits many of its properties from the different tectonic units it is composed of. Therefore, a consistent 3-D model of the crust is important to understand tectonic processes. However, current global crustal models, such as the still widely used Crust 2.0, show large discrepancies with regional data. Additionally, it is often unclear how these models are created. It is therefore necessary to go back to the data and start a new model from scratch, clearly describing the process from data to model.

Using a new methodology based on seismic data, we present an improved model of both the depth to the Moho discontinuity and crustal velocities, ranging from the Anatolian Plateau in the west, to the south-east Asia in the east. For the depth to Moho estimation we exploit knowledge of sediments and topography to apply a "remove-compute-restore" technique, widely used in e.g. gravity field analysis, where first the so called adjusted topography is removed from the data, next the interpolation of residuals is done using ordinary kriging, and finally the adjusted topography is restored to the model. The crustal velocity structure is estimated by locally fitting velocity depth curves to the available data. Both methods allow us to assess the uncertainty of the model, for instance to indicate areas where additional data is required to better constrain the crustal model.

A first analysis of the new Moho depth estimates indicates the presence of a single continuous zone of crustal thickening, ranging from the Anatolian Plateau in the west to the Tibetan plateau in the east. The crustal velocity structure on the other hand is a lot less uniform.