



New Moho estimate and velocity model for Asia

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Asia is a key natural laboratory for the study of active intra-continental deformation in response to the ongoing collision of India and Eurasia. The induced tectonic processes strongly depend on the thermo-mechanical and compositional (density and thickness) structure of the lithosphere. In particular, density anomalies within the crust and upper mantle are important factors that control Earth deformations at shallow and deep levels. Moreover, the inherited heterogeneity is responsible also for the local and regional stress field.

The main aim of this collaborative research project is to construct new high-resolution 3-D models of the compositional, thermal and rheological structure of the lithosphere of the study area. These models will be constructed by combining and jointly analysing satellite gravity data with terrestrial data (seismic velocity distributions, seismic tomography, GPS derived surface deformations, heat flow measurements and terrestrial gravity). These models will be the basis for subsequent 3-D numerical modelling of the intraplate stress and strain fields in Central and Northern Asia.

Here we present an improved estimate of the Moho depth as well as a new model of seismic velocity distribution for Asia. This model is primarily based on seismological and seismic data (amongst others: refraction, reflection, split). Knowledge about the outline of the main tectonic provinces in Asia is used *a priori*. Since data coverage of the primary data is insufficient, secondary data such as topography and distribution of sediments is used to obtain homogeneous models. By combining the primary and secondary data sets using co-kriging, and without assuming isostatic balance *a priori*, statistically optimal results are ensured.