



Preliminary results from receiver function analysis in a seismological network across the Pamir

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The multi-disciplinary Tien Shan-PAmir GEodynamic (TIPAGE) program aims to investigate the dynamics of the orogeny of the Tien Shan and Pamir mountains, which are situated in south Kyrgyzstan and east Tajikistan in Central Asia. Deformation and uplift accompanied by crustal thickening is mainly induced by the collision between the Indian and Eurasian continental plates. As a local feature this collision provides the world's largest active intra-continental subduction zone.

Within the framework of the TIPAGE program we operate a temporary seismic array consisting of 32 broadband and 8 short period seismic stations for a period of two years (from 2008 to 2010) covering an area of 300 x 300 km over the main part of the central Pamir plateau and the Alai-range of the southern Tien Shan. In the first year 24 broadband stations were set up in a 350-km long north-south profile geometry from Osh in southern Kyrgyzstan to Zorkul in south-eastern Tajikistan with approximately 15 km station spacing. We perform a receiver function (RF) analysis of converted P and S waves from teleseismic earthquakes at epicentral distances of 35-95 degrees with a minimum magnitude of 5.5. Therefore we decompose their wavefields by rotating the coordinate systems of the recorded seismograms from a N,E,Z into a SH,SV,P system. RFs are isolated by deconvolution of the P-component from the SH- and SV-component. They provide a robust tool to locate discontinuities in wave velocity like the Moho and thus represent the method of choice to determine crustal thickness. First results show a crustal thickness of 70-80 km. Xenolith findings from depths of 100 km reported by Hacker et al. (2005) give indication for even higher values. The N-S profile geometry will produce a high resolution RF image to map the gross crustal and lithospheric structure. In addition a 2D network with additional 16 stations will enable an investigation of lateral structure variation.

We give an introduction to the project and methodology as well as a presentation of our preliminary most recent results on crustal thickness and Poisson's ratio along the profile from the data of the first year.