

Estimation of 2D and 3D shear wave velocity structure of crust and upper mantle of Northern part of Iranian plateaus

Determination of shear wave velocity structure is important to interpret the tectonic activities in this region. For this goal, we conducted a tomographic inversion of Rayleigh wave dispersion to obtain group velocity tomographic images for the north part of Iran. Estimated group velocity dispersion curves using frequency time analyzing of surface wave have been processed to obtain tomographic. The shear wave velocity structure has been estimated beneath each station by using joint inversion of P-waves receiver functions and dispersion curves of Rayleigh waves. The depths of Moho and the Lithosphere-Asthenosphere Boundary have been estimated. Based on derived results, Moho depth is increasing from southern to northern part of Alborz region, whereas the lithosphere–asthenosphere boundary depth is decreasing from southern to northern part. Our results reveal strong heterogeneity in the upper mantle beneath Alborz region. High velocity anomalies have been observed at depth of ~120 to ~180 km in the upper mantle, which is consistent with the presence of under thrusting of Caspian lithosphere beneath Alborz. We have observed almost well correlation between the thickness of under thrust high velocity layer and surface topography.

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