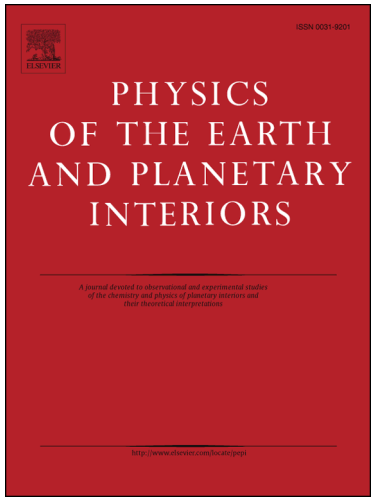

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Crust and upper mantle shear wave structure of Northeast Algeria from Rayleigh wave dispersion analysis

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Abstract

We resolve the crust and upper mantle structure beneath Northeast Algeria at depths of 0–400 km, using inversion of fundamental mode Rayleigh wave. Our data set consists of 490 earthquakes recorded between 2007 and 2014 by five permanent broadband seismic stations in the study area. Applying a combination of different filtering technics and inversion method shear wave velocities structure were determined as functions of depth.

The resolved changes in Vs at 50 km depth are in perfect agreement with crustal thickness estimates, which reflect the study area's orogenic setting, partly overlying the collision zone between the African and Eurasian plates. The inferred Moho discontinuity depths are close to those estimated for other convergent areas. In addition, there is good agreement between our results and variations in orientations of regional seismic anisotropy. At depths of 80–180 km, negative Vs anomalies at station CBBR suggest the existence of a failed subduction slab.

Keywords: MFT. Inversion. Rayleigh wave. Shear wave velocity. Lithosphere. Moho. Northeast Algeria.