



Seismic Tomography Imaging beneath the Arabian Peninsula and Red Sea

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Abstract

Seismic tomography model of the body waves velocity in the upper mantle beneath the Arabian Peninsula, Red Sea and surrounding regions is presented. This model is computed using the P-and S-waves travel times provided by the earthquake catalogue of the International Seismological Center (ISC) 1980-2011. The Red Sea is clearly associated with higher P-velocity anomaly which may testify to the passive character of rifting. Thick lithosphere of the Arabian Platform is imaged as high-velocity anomaly down to 200-250 km depth. Below this plate we observe low-velocity which is interpreted as a mantle plume. Based on the tomography results we propose that this plume played the major role in origin of Cenozoic basaltic fields in western Arabia. In the NE side of the Arabian Plate, we clearly observe the subduction zone beneath Zagros and Makran.

Key words: seismic tomography, Arabian Plate, Red Sea, Cenozoic volcanism, Passive rifting