



Structure of the upper mantle beneath Anatolia resolved from S receiver functions

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We investigate the mantle lithosphere and upper mantle structure of Anatolia using S receiver function analysis performed on the seismic data recorded at the Turkish National Seismic Network and the GEOFON network. The Turkish stations have been operated by the Kandilli Observatory and Earthquake Research Institute (KOERI). Our data set consists of teleseismic waveforms extracted from over 100 permanent seismic broadband stations within the last 10 years. We have selected visually about 9000 S receiver functions with signal-to-noise ratios greater than 3, relatively simple waveforms and good deconvolution results. From these data we constructed several north-south and east-west profiles through Anatolia. A clear observation is a relatively homogeneous negative discontinuity at less than 100km depth beneath the entire region in the 8sec lowpass filtered data. This discontinuity is probably the lithosphere-asthenosphere boundary (LAB). The LAB appears more heterogeneous in the shorter period filtered data implying that it is not a single and relative sharp discontinuity similar to the Moho. To the north of the North Anatolian Fault the LAB seems to reach down to about 150km depth. The 410 discontinuity is well observed as a relatively sharp discontinuity, however, it seems to vanish in eastern Anatolia. Another observation is a negative, also more scattered discontinuity about 50km above the 410 in the entire area. Such a discontinuity is also known from other parts of the Earth and thought to be caused by a low velocity layer containing partial melts or liquids. No additional prominent larger scale discontinuity between the LAB and the low velocity zone on top of the 410 is observed in our data. Also no indication of subduction of the African plate below Anatolia is observed. However, due to the distribution of earthquake sources and seismic stations, we have only few records sampling the southern and southeastern parts of Anato