



The upper mantle transition zone beneath the Ibero-Maghrebian region as seen by teleseismic *Pds* phases

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We analyze the upper-mantle transition zone discontinuities at a depth of 410 km and 660 km as seen from seismic *P*-to-*s* wave conversions beneath the Ibero-Maghrebian region. For this purpose, we use teleseismic events recorded at 259 broadband seismic stations deployed mainly by the TopoIberia project. The detailed analysis of the transition-zone discontinuities provides information on the temperature and composition of the upper mantle at the investigated depths.

The converted waves from the upper-mantle discontinuities arrive in the *P*-wave coda together with other signals and are usually identified on stacked receiver functions. Here, a new processing approach is built, which is leaned on receiver functions and which is based on cross-correlation and stacking techniques, to efficiently detect and extract signals by means of their coherence, slowness, travel time and polarity. In order to add consistency and robustness to the detections, our final results are based on a joint analysis of the receiver functions and two different cross-correlation functionals. This permits to assess errors and to bridge observation gaps due to detection failure of any of the techniques inherent to signal and noise characteristics. Finally, discontinuity depths are determined using time corrections obtained from a 3D velocity model. We present topography maps for the 410-km and 660-km discontinuities, which show variations in the transition zone thickness beneath the study area. The results are discussed to add new constraints on temperature and composition to seismic velocity anomalies observed in the transition zone beneath the controversial Ibero-Magrhrebian region.