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Crustal Thickness in the Ibero-Maghrebian region II: Southern Iberia Peninsula

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During the first leg of the TopoIberia experiment, a total of 86, temporal and permanent, seismic broadband stations were recording in Southern Iberian Peninsula. This station deployment provides an extraordinary regional coverage for investigating structure and seismotectonics of the Northern branch of the Betic-Rif arc, and the Iberian Massif. Here, we analyze P-to-S converted waves in teleseismic receiver functions to infer gross crustal properties as thickness and Vp/Vs ratio. Strong lateral variations of the crustal thickness are observed throughout the region. Crustal thicknesses vary between $\sim$19 km and $\sim$49 km. Homogeneity in the crustal structure is observed for all the stations in the Iberian massif with average crustal thickness of $\sim$30 km and average Vp/Vs ratio of $\sim$1.71. Outside the Iberian Massif the crustal structure is revealed more complex. In the Betic region, a thickened crust underlies the contact between the External and Internal zones with crustal thicknesses between 35 km and 49 km, decreasing its values toward the Alboran Sea ($\sim$ 25 km in the coast). The South-eastern of the Betic region is affected by significant crustal thinning with the presence of dipping crustal-mantle discontinuity with crustal thicknesses between $\sim$30km to $\sim$20 km. The crustal thickness variations are attributed to regional geodynamics possibly the realm of present-day subcrustal dynamics in the final stage of western Mediterranean subduction.