



A sharp Moho step under the Central and Eastern Betics, Western Mediterranean region.

Flor de Lis Mancilla (1,2), Benjamin Heit (3), Jose Morales (1,2), Xiaohui Heit (3), Antonio Molina-Aguilera (1,2), Daniel Stich (1,2)

(1) Instituto Andaluz de Geofísica, Universidad de Granada, Granada, Spain (florlis@ugr.es), (2) Departamento de Física Teórica y del Cosmos, Universidad de Granada, Granada, Spain, (3) Seismology section, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum, Potsdam, Germany

We map the lithospheric structure under the central and eastern Betics (western Mediterranean region) interpreting P-receiver functions obtained from two dense seismic profiles (HIRE and Transcorbe profiles of ~ 120 km and 160 km of length, respectively). The goal is to study the lithospheric structure and its variations between the different geological domains, from the Alboran domain in the south (metamorphic rocks), the External zones (sedimentary rocks) and the Variscan terrains of the Iberian Massif in the north. One of the profiles (HIRE), North-South oriented, crosses the Sierra Nevada Mountains, one of the prominent features in the Western Mediterranean tectonic region with the highest topography of the Iberia peninsula (~ 3400 m). The spacing between stations, around 2km, allows mapping with high accuracy of the variations of the crustal structure. We observe a sharp Moho step of ~ 15 km under the Internal zones of the Alboran domain coinciding the thinner crust with the highest topography along the profile. This agrees with the prior hypothesis about the lack of crustal root underneath Sierra Nevada Mountains and opens a question about the source of the dynamic compensation of its topography. Previous studies showed that the Iberian crust undertrust the Alboran domain under its contact with the External zones observing the presence of slab-type feature of Iberian lithosphere at the western Betics while tearing and delamination of this Iberian slab is proposed at eastern Betics. We observe that the Iberian crust undertrust the Alboran domain and terminate sharply under the contact between the Alpujarride and the Nevado-Filabre complexes (Alboran domain).