Seismic sources at intermediate depth in the Alboran Sea

Elisa Buform\textsuperscript{1}, Lucía Lozano\textsuperscript{2}, Simone Cesca\textsuperscript{3}, Juan Vicente Cantavella\textsuperscript{2}, Maurizio Mattesini\textsuperscript{1}, and Agustín Udias\textsuperscript{1}

\textsuperscript{1}Universidad Complutense, Fac. CC. Físicas, Geofísica y Meteorologia, Madrid, Spain (ebufornp@ucm.es)
\textsuperscript{2}Instituto Geográfico Nacional, Madrid, Spain
\textsuperscript{3}GFZ German Research Centre for Geosciences Potsdam (Germany)

The occurrence of moderate magnitude earthquakes in intermediate depth (40<h<150 km) is a characteristic of the seismicity of the Ibero-Magrebian region. The most important concentration of this activity is in the western part of the Alboran Sea, with the epicenters following an N-S direction. In order to improve the knowledge of the geometry of these seismogenic structures, we have carried out a study of the hypocenters distribution and focal mechanisms for earthquakes that occurred in the period 2000-2020 (M>4.0). For the hypocentral location, we have used a non-linear probabilistic approach (NonLinLoc algorithm) jointly with 3-D lithospheric velocity tomography models recently developed for the Alboran-Betic-Rif zone. Focal mechanisms have been obtained from moment tensor inversion of stations at regional distances (Kiwi tools). Maximum likelihood hypocenters confirm a near vertical N-S distribution in a depth range between 50 and 100 km. Focal mechanisms show a different stress pattern, changing from a vertical tension axis for earthquakes located off-shore and western of 4.5ºW to vertical pressure axis for earthquakes inland and at eastern of 4.5ºW.