



Seismic moment tensor inversion of earthquakes in the Alboran Sea

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The main characteristic of the seismicity in the Alboran Sea is the existence of intermediate depth earthquakes ($30\text{km} < h < 150\text{km}$) with magnitudes that vary from small to moderate ($2.5 < Mw < 4.5$). A seismic moment tensor inversion methodology at regional distances ($100\text{km} < \Delta < 400\text{km}$) has been developed. Seismic sources of four intermediate depth shocks, occurred between 2002 and 2004, have been studied. Theoretical Green functions have been calculated applying the reflectivity method to a horizontal layered medium. Due to the complexity of the studied region, three different lithospheric models have been tested. The inversion is performed by fitting amplitude spectra in order to obtain moment tensor components, scalar seismic moment and source time function. Three components of P and S wave-forms have been used. Data are taken from broad-band stations belonging to different networks: the ROA/UCM, the TEDESE and the Spanish Seismological Digital Network. All the stations are located at the South of the Iberian Peninsula and North of Morocco. Results are compared with previous studies for this region and with first motion polarities solutions. Both normal and reverse faulting mechanisms are obtained with no apparent relation with depth. Scalar seismic moments range between 10^{14}Nm to 10^{15}Nm . Duration of the source-time functions is smaller than 0.5s , similar values to those obtained using the empirical Green function method.