



Estimation of radiated energy for deep earthquakes

Carolina López-Sánchez, Elisa Buforn, Maurizio Mattesini, and Agustín Udías

Universidad Complutense, Fac. CC. Físicas, Geofísica y Meteorología, Madrid, Spain (ebufornp@ucm.es)

The occurrence of very deep earthquakes ($h > 600$ km) is a characteristic of the subduction regions and their origin represents a long-standing geophysical open question. A special case is the southern Spain (Granada region) where from 1954 five very deep earthquakes ($h \approx 650$ km) with magnitudes between 4.4 and 7.8 have occurred. The most recently deep earthquake was registered on 11th April 2010 with depth 623 km and magnitude M_w 6.2. In this study, we estimate its radiated seismic energy (E_s) in order to understand the rupture process. The method that we have used is based on the direct integration of P wave waveforms. We have selected seismograms recorded at teleseismic (35 stations) and regional distances (72 stations). We have obtained energy values ranging from $6.00 \cdot 10^{12}$ J to $1.31 \cdot 10^{14}$ J with an average value of $(1.65 \pm 1.01) \cdot 10^{13}$ J for teleseismic distances and $3.28 \cdot 10^{12}$ J to $4.96 \cdot 10^{14}$ J with an average value of $(5.24 \pm 1.03) \cdot 10^{13}$ J for regional distances. These energies have been compared with other values obtained from recently occurred events in Peru-Brazil and Fiji-Islands in 2018. Finally, we have studied the relationship between E_s/MoS and depth.