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Moment Tensor solutions in the SIicily channel

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Seismicity in the Sicily Channel is generally of small magnitude, and earthquake focal mechanisms are very rarely included in the catalogues. We have attempted in this work to provide moment tensor solutions for small and moderate earthquakes in the region. The analysis was performed using data coming from the permanent Italian seismic network, run by the Istituto Nazionale di Geofisica e Vulcanologia (INGV), and the WDD seismic station located in Malta and managed by the Physics Department, University of Malta. We applied the "Cut And Paste" (CAP: Zhu and Helmberger, BSSA-1996) and the SLUMT (Herrmann 2008) methods based on broadband waveform inversion. The source depth and focal mechanisms are determined using a grid search technique. Both methods allow time shifts between synthetics and observed data in order to reduce dependence of the solution on the assumed velocity model and on earthquake locations. This method, successfully applied also in the case of earthquakes with magnitude lower than 3 in other regions (D'Amico et al. PEPI-2010, BGTA-2010; Zhu et al., GRL-2006), furnishes good-quality solutions in the area in a magnitude range not properly represented in the official databases and in the major literature. The results will lead us to obtain remarkable progress in the knowledge of tectonic stress accumulation mechanisms and consequent processes of seismogenic faulting in the area of interest.