Geophysical Research Abstracts
Vol. 14, EGU2012-8549, 2012
EGU General Assembly 2012

Temporal variation of shear-wave splitting parameters related to Movri Mountain earthquake in northwest Peloponnese (Greece)

D. Giannopoulos (1), E. Sokos (1), K. Konstantinou (2), A. Lois (1), and G-A Tselentis (1)

(1) University of Patras, Seismological Laboratory, Rio 26504, Greece (dgiannopoulos@upatras.gr), (2) Institute of Geophysics, National Central University, Jhongli, 320 Taiwan

On June 8, 2008, at 15:25 local time (12:25 GMT) an Mw 6.4 earthquake occurred in the area of northwest Peloponnese, Western Greece. The epicenter was located in the municipality of Movri, about 35 km southwest of Patras. A crustal anisotropy analysis was performed in the epicentral area in relation to the occurrence of the earthquake. We used seismic records from the nearest station, to the Movri Mountain earthquake epicentre, which was in continuous operation during the periods before and after the occurrence of the earthquake. The method that was used to study shear-wave splitting phenomenon was the cross-correlation method. Data processing provided, splitting parameters φ (polarization direction of the fastest component of shear waves) and dt (time delay between the two components) for each seismic event. Data analysis revealed the existence of shear-wave splitting phenomenon in the study area. Both before and after the occurrence of Movri Mountain earthquake, the polarization directions of the fast component of shear waves follow a general NNW-SSE direction. The observed mean fast polarization direction is not consistent with the estimated characteristics of the regional stress field which has a general E-W direction of the maximum horizontal compressive stress. The difference between the estimated fast polarization directions and the properties of the regional stress field shows the presence of a local stress field in the study area, possibly connected with the fault damage zone. An increase in time delays was observed after the occurrence of Movri Mountain earthquake. The average value of delay times before the occurrence of the earthquake was about 27.3ms, while after the occurrence it was about 41.7ms. The increase in delay times indicates possible changes in the properties of the medium in the upper crust. We suggest that the occurrence of Movri Mountain earthquake caused the expansion/ lengthening of micro-cracks and its further filling with fluids.