Geophysical Research Abstracts,
Vol. 11, EGU2009-6782, 2009
EGU General Assembly 2009

Aftershocks relocation and slip distribution of the 8 June 2008 (Mw 6.4) earthquake in NW Peloponnese, western Greece

K. I. Konstantinou (1), N. S. Melis (2), S. J. Lee (3), C. P. Evangelidis (2), and K. Boukouras (2)

(1) National Central University, Dept of Earth Sciences, Jhongli, Taiwan (kkonst@ncu.edu.tw), (2) National Observatory of Athens, Institute of Geodynamics, Athens, Greece, (3) Academia Sinica, Institute of Earth Sciences, Taipei, Taiwan

On 8 June 2008 at 12:25 (GMT) a Mw 6.4 strong earthquake occurred in the area of NW Peloponnese, western Greece, causing the death of two people and extensive damage to the surrounding area. The main event and its aftershocks were recorded by one nationwide and three regional networks equipped with three-component broad-band seismometers. Initial locations of the earthquake sequence comprising 410 aftershocks showed a linear NE-SW trend and the mainshock was located at 22 km depth. After the relocation using catalog and differential travel times, most events form three distinct clusters at depths 15-25 km. Moment tensor solutions for the main event and its largest aftershocks exhibited a pure strike-slip mechanism with one nodal plane orientated NE-SW in accordance with the relocated seismicity. A parallel, non-negative least-squares inversion technique utilizing multiple time windows was used to derive the spatiotemporal slip distribution of the main event. The resulting slip distribution model revealed a large slip patch (maximum slip $\tilde{2}$00 cm) between 10-20 km depth at the NE part of the fault that also coincides with the area that suffered most of the damage. Another patch exhibiting smaller amounts of slip (20-50 cm) is located to the SW direction at the same depth range, while smaller patches exist at 25-30 km depth. Most aftershocks are located in areas of low slip ($<$ 25 cm) filling the regions of slip deficit. The 8 June earthquake occurred at an area where no previous seismological or other observations indicated the existence of a seismogenic fault at that depth and with this strike. This and the fact that the event nucleated in the middle to lower crust, may be interpreted as the reactivation of a fault structure that was inherited from previous tectonic phases.