



Slip distribution and forward modeling of geodetic and seismological data of the 20 June 1978 Thessaloniki (northern Greece) earthquake

Z. Roumelioti (1), N. Theodulidis (2) and A. Kiratzi (1)

(1) Department of Geophysics, Aristotle University of Thessaloniki, P.O. Box 352-1, 54124, Thessaloniki, Greece, (2) Institute of Engineering Seismology and Earthquake Engineering, P.O. Box 53, 55102, Thessaloniki, Greece (zroum@lemnos.geo.auth.gr)

We investigate the rupture process of the 20 June 1978, $M_w=6.5$, Thessaloniki (northern Greece) earthquake through a linearized least-squares inversion of teleseismically recorded body waves. This earthquake ranks as one of the most important recent events in Greece due to its occurrence in the vicinity of the second largest city of Greece and its significant effects on the built environment of the entire Prefecture of Thessaloniki. The derived slip distribution model of the examined earthquake includes a major slip patch between the lakes of Laghada and Volvi, at the center of the Mygdonia graben. The credibility of the model is tested in terms of its ability in reproducing geodetic and macroseismic data of the 1978 event. The derived slip distribution pattern is used to compute synthetic displacements at the surface of the meizoseismal area, which are compared with leveling data and peak ground velocities, which are indirectly compared with macroseismic intensity measurements. Furthermore, site-specific validation is performed through forward modeling one strong-motion record of the examined earthquake, recorded at the center of Thessaloniki. Despite the gross character of the computed slip distribution model imposed by the low-frequency character of the inverted teleseismic data, comparisons between predicted and observed data are in an overall satisfactory agreement.