Geophysical Research Abstracts
Vol. 19, EGU2017-13035, 2017
EGU General Assembly 2017

Source properties of the three mainshocks of the 2016 Amatrice, Central Italy, earthquake sequence

Frantisek Gallovic (1), Francesca Pacor (2), Lucia Luzi (2), Rodolfo Puglia (2), and Daniele Spallarossa (3)

(1) Charles University, Faculty of Mathematics and Physics, Department of Geophysics, Prague, Czech Republic (gallovic@karel.troja.mff.cuni.cz), (2) Istituto Nazionale di Geofisica e Vulcanologia, Milan, Italy, (3) University of Genoa, DISTAV, Genoa, Italy

We perform detailed analysis of the rupture processes of the three mainshocks of the 2016 Amatrice, Central Italy, earthquake sequence using seismological data. Kinematic slip inversion utilizing exceptionally dense near-field accelerograms in frequency range <0.5Hz suggests that the events happened on a single normal fault with complementary slip distributions. The first Mw 6.2 shock (08/24) with maximum slip of ∼0.5m was followed after 2 months by another Mw 6.1 earthquake (10/26) with similar maximum slip. These two events had left an unruptured ∼10x5km large central segment of the normal fault. After 4 days (10/30), this segment failed in the largest earthquake of the sequence (Mw 6.5), releasing significant slip amount (∼3m) that partially reached the topographic surface. The three events were characterized by diverse rupture propagation styles.
To gain further insight in the source properties and radiation we analyze source time spectra of the events in a broad frequency range (up to 20Hz) by means of the Generalized Inversion Technique. We relate the inferred source characteristics with the geometrical and rheological complexities of the area, such as the pre-existing Sibillini thrust fault system that intersects the causative normal fault.