SECOND EUROPEAN CONFERENCE ON EARTHQUAKE ENGINEERING AND SEISMOLOGY, ISTANBUL AUG. 25-29, 2014

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SPATIO-TEMPORAL PROPERTIES OF THE 2013 AIGIO EARTHQUAKE SWARM (CORINTH GULF, GREECE)

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The Corinth Rift is one of the most seismically active and most recent extensional structures in the Mediterranean region. With an almost east-west orientation, the shape of the rift is characterized as an asymmetric half-graben with an opening rate ranging between 5-15 mm/yr from the east to the west part of the gulf (Briole et al., 2000). Normal faults bounding the southern coastline and dipping to the north, are the most active ones in comparison with the offshore and their antithetic ones. Several destructive earthquakes have been occurred in both historical and instrumental eras. Recent seismicity is manifested with a huge number of small magnitude shocks particularly in the western and central part of the gulf. The 2013 Aigio earthquake swarm was initiated on May 21 and lasted approximately three months. The area of the seismic excitation is approximately 5 km SE of Aigio city and close to the West Helike fault. We used the recordings of the Hellenic Unified Seismological Network (HUSN), which is adequately dense in the area, to locate the earthquake swarm by manually picking P- and S- arrivals of 1513 events. The selected stations are located in a distance 100 km around the seismic excitation. A local velocity model, proposed by Rigo et al. (1996) for the broader area is used. Firstly, the HYPOINVERSE program was used to locate the earthquakes along with time corrections for the stations used. The data then were relocated using double difference technique (Waldhauser and Ellsworth, 2000; Waldhauser, 2001) along with differential times derived from waveform cross correlation (Schaff et al., 2004), in order to achieve highly accurate hypocenter locations. Spatio-temporal distribution of earthquakes revealed a migration of hypocenters eastwards and westwards of the initiative point suggesting the division of the seismic excitation into 5 major clusters. In the first 20 days the seismicity was pretty intense followed by a silent period of about 30 days. After that a new burst of seismicity was observed in the western part of the activated area that lasted about one month. The magnitudes of earthquakes in each cluster are $0.2 \leq M \leq 4.0$ with the largest earthquakes not occurring at the beginning of each cluster but scattered in time. Focal mechanisms of 160 events with $M \geq 2.0$, which determined using first motions of P-waves (FPFIT), were used to identify geometry and kinematic properties of the ruptured segments. The indicated ruptured surfaces revealed normal shallow dipping faults in agreement with the spatial distribution of the earthquakes and the regional stress field. The migration of hypocenters is corroborated by the Coulomb stress changes, revealing that the seismicity in a segment was triggered by the rupture in the previous nearby segment. The major clusters were divided into sub-clusters and their skewness and kurtosis of seismic moment

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release history were calculated in order to characterize them as earthquake swarms or Mainschock – Aftershock sequence (Mesimeri et al., 2013).

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