



Seismicity and seismogenic structures of Central Apennines (Italy): constraints on the present-day stress field from focal mechanisms - The SLAM (Seismicity of Lazio-Abruzzo and Molise) project

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We present new results for the microseismic activity in the Central Apennines recorded from a total of 81 seismic stations. The large number of recording sites derives from the combination of temporary and permanent seismic networks operating in the study region.

Between January 2009 and October 2013 we recorded 6923 earthquakes with local magnitudes ML ranging from 0.1 to 4.8. We located hypocentres by using a refined 1D crustal velocity model. The majority of the hypocenters are located beneath the axes of the Apenninic chain, while the seismic activity observed along the peri-Tyrrhenian margin is lower. The seismicity extends to a depth of 32 km; the hypocentral depth distribution exhibits a pronounced peak of seismic energy release in the depth range between 8 and 20 km. During the observation period we recorded two major seismic swarms and one seismic sequence in the Marsica-Sorano area in which we have had the largest detected magnitude ($ML = 4.8$). Fault plane solutions for a total of 600 earthquakes were derived from P-polarities. This new data set consists of a number of focal plane solutions that is about four times the data so far available for regional stress field study. The majority of the focal mechanisms show predominantly normal fault solutions. T-axis trends are oriented NE-SW confirming that the area is in extension. We also derived the azimuths of the principal stress axes by inverting the fault plane solutions and calculated the direction of the maximum horizontal stress, which is mainly sub-vertical oriented. The study region has been historically affected by many strong earthquakes, some of them very destructive. This work can give an important contribution to the seismic hazard assessment in an area densely populated as the city of Rome which is distant around 60 km from the main seismogenic structures of Central Apennine.