



Seismotectonic setting of the Sulmona basin area (Abruzzo, central Italy) - Evidence from microearthquake activity and focal mechanisms

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The intra-Apennine extensional zone of central Italy is well known from the seismotectonic point of view. It is characterized by shallow crustal seismicity, prevalently concentrated within a narrow strip of SW-dipping normal faults which extends along the axis of the Apennine chain. Notwithstanding there are still areas, as the Sulmona basin (Abruzzo region) that, in spite of beautiful exposures of active faults, are not constrained from a seismogenic point of view, due to the lack of significant instrumental activity. From the observation of instrumental data, indeed, the Sulmona area appears almost aseismic; conversely highly damaging events struck the area in historical times (2nd century A.D., Mw 6.3; 1706, Mw 6.8; 1933, Mw 6.0). As a consequence, no specific information is available about the active state of strain, but at the same time several studies recognized the high seismogenic potential of the existing faults.

In order to investigate these active tectonic structures, and specifically the Morrone-Porrara alignment (which bounds the eastern edge of Sulmona plain), we carried out a microseismicity study through a local seismometric network, named Sulmona Temporary Network (STN). The collected data from 27 May 2009 to 22 November 2011 allowed us to define a 1D velocity model for the study area and then to accurately relocate more than 700 microearthquakes, most of which not detected by the national seismic network. Their local magnitudes range from -1.5 and 3.7 and the completeness magnitude reached by STN during the first seven months of the experiment is equal to 1.2. We also computed 35 new focal mechanisms, very useful into defining the kinematic behaviour of active faults in the study area.