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# HIGH RESOLUTION ANALYSIS OF THE POLLINO MTS. SEISIMC SEQUENCE (SOUTH ITALY): UNRAVELING THE FAULT SYSTEM ARCHITECTURE

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The Pollino Mts. region is located in a junction area between the Calabrian Arc and the southern Apennines domains (south Italy) and has been proposed, according to paleoseismological evidences, as a seismic gap capable to generate earthquakes of magnitude 6.5–7. In this area a seismic crisis of thousands of small to moderate earthquakes, with maximum magnitude Ml 5.0, has been occurring since Spring 2010 (Totaro & al., SRL 2013).
We investigate the space-time evolution of the seismic activity in order to unravel the fault system architecture and its mechanical behaviour. We first obtained hi-precision hypocenter locations by applying the double-difference method and then refined them by relative timing by cross-correlation of seismograms (Waldhauser & Ellsworth, BSSA 2000; Schaff & al., BSSA 2004; Waldhauser & Schaff, JGR 2008). We also computed focal mechanisms by applying the waveform inversion "Cut And Paste" method (Zhao & Helmberger, BSSA 1994; Zhu & Helmberger, BSSA 1996).
The combined use of high-resolution seismic catalogue, information on clusters of similar earthquakes and high quality focal mechanisms plus comparison with surface geology allow us to highlight important aspects of the mechanical behaviour of major and minor faults in the Pollino area. Seismicity defines multiple clusters, but the one furthest west is by far the most intense and is the main subject of our interpretation so far. The 3D pattern of hypocenters and focal mechanisms are consistent and image a NNW-striking and west-dipping fault zone between 5 and 10 km deep and 10 km along strike, with predominantly normal motion. This fault kinematics fits the overall pattern of active faults in the Mercure Basin and western Pollino area, although the strike of this currently seismogenic fault is more northerly than most faults highlighted in the area (Ghisetti & Vezzani, 1983; Brozzetti & al., Tectonophysics 2009). The cluster has a sharp floor at a depth of about 10 km and most of the larger earthquakes are close to that limit. As expected, smaller earthquakes populate the fault zone defined by the larger events and by focal mechanisms, but also the hangingwall side of this fault, possibly involving antithetic faults. This earthquake source zone exhibits significant changes along strike. Toward the north, the floor of the seismicity deepens significantly and the dip of the fault steepens. This change is abrupt; it defines a southern and northern segment of the main fault and suggests a high-angle intersection with another fault. The low dip to the west in the southern segment is highlighted primarily by the hypocenter distribution, while most of the focal mechanisms in the deeper part of this segment maintain an intermediate to steep dip. This geometry leads to the hypothesis of an intersection between the steep lower seismogenic fault and a shallow-dipping more regional detachment.