



Array monitoring of swarm earthquakes in the Pollino range (Italy)

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The Mercure Basin (MB) and the Castrovillari Fault (CF) in the Pollino range (southern Apennines, Italy) represent one of the most prominent seismic gaps in the Italian seismic catalog, with no $M > 6$ earthquakes during the last centuries. In recent times, the MB has been repeatedly interested by seismic swarms, with the most energetic swarm started in 2010 and still active in 2013. The seismic activity culminated in autumn 2012 with a $M = 5$ event on October 25. In contrast, the CF appears aseismic. Only the northern part of the CF has experienced microseismicity. The rheology of these faults is unclear. Current debates include the potential of the MB and the CF to host large earthquakes and the level and the style of deformation. Understanding the seismicity and the behaviour of the faults is therefore necessary to assess the seismic hazard.

We have been monitoring the ongoing seismicity using a small-aperture seismic array, integrated in a temporary seismic network. The instruments are provided by the GFZ German Research Centre for Geosciences and INGV, Italy, and are operated in close collaboration between both institutes.

Automatized seismic array methods are applied to resolve the spatio-temporal evolution of the seismicity in great detail. Using the GFZ array, we detect about ten times more earthquakes than currently included in automatic local catalogues. The increase corresponds to an improvement in complete event detection down to $M \sim 0.5$. Event locations and the magnitude-frequency distribution are analysed to characterise the swarm and investigate the possible role of fluids for earthquake triggering. In the course of the swarm, seismicity has mainly migrated within the Mercure Basin. However, the spread towards the northern end of the Castrovillari fault to the east in 2013 marks a swarm phase with seismicity located outside of the Mercure Basin. The observations characterize the behaviour of the faults and their inter-connection.