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The 21 August 1962 Irpinia (Southern Italy) seismic sequence: new insight on the first shock

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On August 21, 1962 a seismic sequence occurred near Benevento, in Southern Apennines. In less than forty minutes (18:09, 18:19 and 18:44 UTC) three main events (max M 6.1) occurred in the same area, where several historical destructive events took place, and accordingly where the seismic hazard is one of the largest of Italy.
The 1962 multiple earthquakes occurred in a very particular period of the history of instrumental seismology. The early 1960's is considered a turning point in the modern seismology, because two standardized network have been installed all over the world: the Worldwide Standardized Seismograph Network (WWSSN) and the Unified Seismic Observation System (ESSN) in the former Soviet Union.
However, most of the Euro-Mediterranean seismological observatories and stations continued to operate with the most diverse and heterogeneous instrumentation, often designed at the beginning of the 20th century. In particular mechanical seismographs as Wiechert and Mainka or electromagnetic with galvanometric recording as Galitzin.
For the 21 August 1962 sequence, the SISMOS database supplies 245 high-resolution scans (300 components) of the seismograms recorded at 58 different stations and 40 different standard and not standard instruments, both on smoked and photographic paper.
The occurrence so close of the three shocks (35 minutes) caused a mutual contamination of individual event signals, so that the estimated focal mechanisms with wave form modelling (e.g. Vannoli et al., 2015, BSSA, doi: 10.1785/0120140263) would be inaccurate. Therefore the focal mechanism solution of the first main shock (18:09 UTC) was calculated from the 32 first P arrival polarities read on a selection of the available seismograms scans.
We determinate the location, the magnitude, and the nodal plane associated with the first event of the 21 August 1962 sequence. The focal mechanism shows a strike-slip rupture along a north dipping, E-W striking plane. These results are crucial in the identification of the fault responsible for this key-event in Southern Apennines. Therefore the kinematics of this event significantly differs from that typical of the crest of the Southern Apennines, characterized by almost purely normal slips along NW-SE striking faults.