

Title: Integrated study of active faults and their seismotectonic context in selected parts of the Southern Apennines

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Research Program

Active tectonics in southern Italy appears segregated in two discrete domains, which are characterized by different deformation mechanisms. In the western domain, active extension is accommodated by a swarm of normal faults running along the axis of the Apennines. These faults are thought to extend down to ~10-15 km and are responsible for large ($M \sim 7$) historical and instrumental earthquakes. The nucleation depth of these earthquakes indicate that the faults are rooted in the Apulia carbonate platform underlying the southern Apennines thrust belt. In the eastern domain encompassing the foothills of the Apennines and the Apulia foreland, strike-slip earthquakes with focal depths deeper (~15-35 km) than the extensional earthquakes in the west are associated to slip on surface or blind faults in the Apulia platform crystalline basement.

Despite that many of the largest earthquakes have been associated to a causative fault, large uncertainties still exist regarding definition of source geometric, kinematic and energetic parameters (e.g. slip rates); this represents a severe drawback for the growing practice of seismic hazard estimation based on tectonic information for individual seismogenic sources. The definition of such parameters relies on a seismotectonic model, where the spatial relations between active faults and the crustal structure of the orogen plays a prominent role.

The active tectonics group at DiSTAR has been long working on active faults and on their seismotectonic and crustal parameters together with national (e. g. Istituto Nazionale di Geofisica e Vulcanologia, INGV) and international institutions, and plan to deepen observation and modelling strategies in the near future.

PhD project proposal

The Department of Earth Science, Environment and Resources (DiSTAR) of the University of Naples Federico II seeks candidates for a PhD project on the analysis of active crustal deformation in selected parts of the Southern Apennines. The focus of research will be on field and remote (DTM, GNSS, InSAR) analyses combined with interpretation of seismic reflection profiles provided by industry and with morphotectonic analysis to reconstruct the spatial architecture and current kinematics of active and seismogenic faults.

The research project will be carried out in collaboration with INGV-Rome, where the successful candidate will carry part of his research tasks.

The expenses of the PhD candidate related to the project activities will be covered by funds DiSTAR and INGV. The candidate is expected to own sound bases of structural geology/tectonics and a general knowledge of software for elaboration of spatial data (GIS) and seismic profile interpretation.