

STYLES OF SEISMOGENIC FAULTING IN THE SOUTHERN CALABRIAN ARC AND THEIR GEODYNAMIC SIGNIFICANCE

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About one fourth of the largest Italian earthquakes concentrates in a narrow strip of land (roughly 200x70 km) corresponding to the administrative region of Calabria. Nevertheless, the present-day seismicity, both shallow and deep, provides little help in detecting the region's most insidious seismogenic structures, nor does the available record of GPS-detected strains.

In addition to its fierce seismicity, the Calabrian Arc also experiences uplift at rates that are the largest in Italy, thus suggesting that active tectonic processes are faster here than elsewhere in the country.

Calabrian earthquakes are strong yet inherently elusive, and even the largest of those that have occurred over the past two centuries do not appear to have caused unambiguous surface faulting. The identified active structures are not sufficient to explain in full the historical seismicity record, suggesting that some of the main seismogenic sources still lie unidentified, for instance in the offshore. As a result, the seismogenic processes of Calabria have been the object of a lively debate at least over the past three decades.

Tiberti *et al.* (2017) have used the current geodynamic framework of the Calabrian Arc as a guidance to resolve the ambiguities that concern the identification of the presumed known seismogenic sources, and to identify those as yet totally unknown. Their proposed scheme is consistent with the location of the largest earthquakes, the recent evolution of the regions affected by seismogenic faulting, and the predictions of current evolutionary models of the crust overlying a W-dipping subduction zone. In their turn, Maesano *et al.* (2017) have proposed a full reconstruction of the subduction interface based on a reinterpretation of reflection seismology and seismicity data. Their findings are consistent with the scheme devised by Tiberti *et al.* (2017), suggesting that the ongoing subduction may explain most if not all of the “anomalies” that characterise the southern Calabrian Arc with respect to the rest of the Italian peninsula, including faster uplift rates, faster tectonic rates, larger earthquake rates, and larger magnitude earthquakes.

References

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