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Faults distribution and seismogenic potential in the Calabrian back-arc domain, SE Tyrrhenian Sea

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The Western Calabrian margin (Italy) is the most active segment of the Apennine back-arc system, formed in response to the slow Africa – Eurasia convergence. The offshore area represents the transitional region between the arc and the back-arc: it is affected by several fault systems, most of them able to trigger highly destructive earthquakes. Indeed, the Calabria and its western offshore are characterized by the highest seismic moment release of the entire Apennines, also evidenced by historical seismicity catalogue, the most accurate over the world. During last decades, scientific community invested huge resources in assessment of seismic and tsunami hazards. Furthermore, during last years several local-scale works allowed of improving knowledge of the faults geometry, magmatism, seismogenic and tsunamigenic potential along the western offshore region (Loreto et al., 2017; Brutto et al., 2016; De Ritis et al., 2019). Some active faults, belonging to NE-SW-trending normal fault systems accommodating the inner-arc collapse related to slab-decupling, are also responsible of the most destructive historical sequences, still to be adequately characterized. Using vintage SPARKER 30 Kj acquired in the seventies and recent multichannel seismic profiles together with middle resolution morpho-bathymetric data we produced a new tectonic map of the Calabria back-arc system. Further, we characterized some before-unknown faults and linked them with shallow structures, as ridges and slumps / slides. This area seemingly less populated of faults compared to the peri-Tyrrhenian margin, where several faults belong to different systems, i.e. (i) the rifting system active that allowed the opening of the Tyrrhenian Basin and (ii) the slab-decupling related normal faults system currently active. The comparison with historical and instrumental seismicity allowed us to highlight possible seismic gaps that, if considered, could strongly improve the map of seismogenic potential of the Tyrrhenian back-arc system.

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