# Volcanism at Slab Tear Faults: the Diamante-Enotrio-Ovidio volcanic complex (offshore north-west Calabria)

De Ritis R.*[1], Pepe F.[2], Orecchio B.[3], Casalbore D.[4], Bosman A.[5], Chiappini M.[1], Chiocci F.L.[4], Corradino M.[2], Nicolich R.[2], Martorelli E.[5], Monaco C.[6], Presti D.[3] & Totaro C.[3]

[1] Istituto Nazionale di Geofisica e Vulcanologia, Roma
[2] Dipartimento di Scienze della Terra e del Mare (DiSTeM), Università di Palermo
[3] Dipartimento di Fisica e di Scienze della Terra, Università di Messina
[4] Dipartimento Scienze della Terra, Università Sapienza di Roma
[5] Istituto di Geologia Ambientale e Geoingegneria (Centro Nazionale Ricerche), Roma
[6] Dipartimento di Scienze Biologiche, Geologiche e Ambientali, Università di Catania

* *Corresponding email:* riccardo.deritis@ingv.it

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Several arc-shape sectors form the central and southern part of the Italian peninsula, representing the emerged portion of the continental crust disjoined by slab tear faults (e.g., Olevano-Antrodoco, Ortona-Roccamonfina Tindari-Letojanni faults). These sectors are characterized by different drift velocities and tectonic patterns, while above to them important volcanic phases developed, such as the Vulture volcano (onshore) and the Vulcano-Lipari-Salina alignment (offshore). In the Tyrrhenian basin such kind of volcanism is still poorly investigated and understood though it could be revealed by low-resolution geophysical anomalies and volcanic seafloor morphologies. This is probably due to the fact that this volcanism is characterized by multifarious evolutionary steps, developed and overlapped during its formation since Miocene time. In this work, we present new geophysical data about an unknown intrusive-effusive volcanism affecting a 40 × 52 km large area of the northern part of the Western Calabrian Offshore, about 20 km far the shoreline. The integration of high-resolution multibeam bathymetric data, seismic reflection data, regional magnetic anomalies and local earthquake tomography highlights the volcanic nature of this area, where the Diamante, Enotrio and Ovidio seamounts structure (DEOS) is present. Seismic profiles show that the DEOS developed in an area strongly intruded by volcanics that locally reach the seafloor forming the volcanic edifices. Magmatic mounds and associated structures, which include chimneys and lava flows, are observed within different upper PQ sedimentary levels. Three fault systems associated with positive flower structures are identified. They offset both volcanics and sedimentary cover of the Diamante volcano reaching the sea floor, giving place to a set of steep and 1-6 km long scarps oriented between N10°E and N34°E. Moreover, significative magnetic signatures placed in correspondence of northern side of the Ovidio as well as above the Diamante seamounts highlight the presence of deep rooted magnetized volcanic feeding system remnant. The local earthquake tomography further support these findings, revealing beneath the DEOS evidence of gas-filled porosity probably related to magma cooling. The DEOS area lies at the northern boundary of the subducting Ionian slab, at the termination of the Palinuro-Glabro seamounts alignment. We suggest that DEOS represents the easternmost Pleistocene volcanic activity developed along the TF bordering the northern side of the Ionian subducting slab, in proximity of its hinge. We also discuss the overall flat-topped morphology of Ovidio Seamount as the result of the interplay between sea-level fluctuations and subsidence.