



## **Analog modeling of the deformation and kinematics of the Calabrian accretionary wedge**

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The Calabrian accretionary wedge in the Ionian Sea, is the site of slow, deformation related to the overall convergence between Africa and Eurasia and the subduction zone beneath Calabria. High-resolution swath bathymetric data and seismic profiling image a complex network of compressional and strike-slip structures. Major Mesozoic rift structures (Malta Escarpment) are also present and appear to be reactivated in places by normal faulting. Ongoing normal faulting also occurs in the straits of Messina area (1908 M7.2 earthquake). We applied analog modeling using granular materials as well as ductile (silicone) in some experiments. The objective was to test the predictions of certain kinematic models regarding the location and kinematics of a major lateral slab edge tear fault. One experiment, using two independently moving backstops, demonstrates that the relative kinematics of the Calabrian and Peloritani blocks can produce a zone of dextral transtension and subsidence which corresponds well to the asymmetric rift observed in seismic data in the southward prolongation of the straits of Messina faults. However, the expected dextral offset in the deformation front of the accretionary wedge is not observed in bathymetry. In fact sinistral motion is observed along the boundary between two lobes of the accretionary wedge suggesting the dextral motion is absorbed along a network of transcurrent faults within the eastern lobe. Bathymetric and seismic observations indicate that the major dextral boundary along the western boundary of the accretionary wedge is the Alfeo fault system, whose southern termination is the focal point of a striking set of radial slip-lines. Further analog modeling experiments attempted to reproduce these structures, with mixed results.