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Calabrian Arc Hazards in Ionian and Tyrrhenian Seas: First results from the CHIANTI cruise

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The main objective of the CHIANTI cruise was to collect geophysical marine data to determine the deep crustal structure and plate geometry across the subduction system of the Ionian and Tyrrhenian Seas, from the frontal wedge to the arc and back-arc. The goal is to study the processes that operated during the subduction of the Ionian slab of oceanic crust under Calabria, which lead to the development of the Aeolian volcanic arc, and the subsequent opening of the Tyrrhenian basin, and are responsible of the geological hazards that threaten the region. The CHIANTI cruise onboard the Spanish R/V BO Sarmiento de Gamboa started in Barcelona (Spain) on July 12, and finished in Catania (Italy), on August 28, 2015. It consisted of four legs devoted to acquisition of data with different seismic/acoustic techniques in the Tyrrhenian and Ionian Seas. Leg 1 and 2 were focused on the acquisition of deep penetrating Wide-Angle Reflection and Refraction Seismic (WAS) data, Leg 3 on Multichannel Seismic (MCS) Reflection data and finally Leg 4 was devoted to sidescan imaging, coring and single channel seismic acquisition. During the entire cruise, complementary acoustic data (i.e. multibeam bathymetry and sub-bottom profiler) were acquired simultaneously.
In this presentation we focus on the seafloor mapping and processed multichannel seismic reflection grid collected on the IONIAN prism. The data show abundant evidence of ongoing widespread deformation across the entire region from the deformation front to the uppermost slope and extending into the Calabrian emerged region. The seafloor mapping shows numerous mud volcanoes associated to fault activity. The seismic images display deformational features active across the entire prims at different locations extending the definition of structures described in previous works of the region with fewer areal coverage. The data show a prism tectonic structure that is distinct from the structure of prism in other subduction systems worldwide.