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1 Seabed imagery of newly-discovered mud volcanoes in the central Mediterranean Sea (Calabrian Arc): results from HERMES-HYDRAMED IONIO 2005

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A new province of cold seep features was discovered in the northern Ionian Sea during the summer 2005 campaign of the Italian research vessel OGS Explora. The purpose of the HERMES-HYDRAMED IONIO campaign was to investigate shallow fluid/gas escape processes on the Calabrian Arc, an accretionary prism resulting from the subduction of the African below the European plates and thought likely to contain cold seeps by analogy with the larger accretionary prism of the Mediterranean Ridge. Multibeam bathymetric data were acquired over a c. 225 x 160 km area of the Calabrian Arc, in depths of 1500-3500 m, along with multichannel seismic reflection data and gravity cores from selected targets. In this poster, we present seabed imagery and seismic reflection profiles illustrating the different types of mud volcanoes (cones and pies) recognised in study areas on the inner and outer Calabrian Arc.

The multibeam seabed imagery features of mud volcanism in water depths of 1900-2300 m, superimposed on the large-scale tectonic structures of the inner and outer Calabrian Arc. On the inner Arc, in the Spartivento Basin, the Explora mounds include a pair of seabed cones referred to as the Gemelli, each up to 1.5 km wide and 200 m high, that lie within an elongate seabed depression. Seismic data indicate the

seabed depression to be structurally controlled and show the Gemelli to comprise unstratified lenses up to 300 ms thick that appear to interfinger with the flanking Plio-Quaternary succession. On the outer Arc, 60 km to the south, the Pythagoras mounds are dominated by a circular mud pie up to 8 km wide and 250 m high, referred to as the Ciccione, the top of an inverted sediment cone that extends at least 2 seconds below seabed above inward dipping reflectors. Gravity cores from both the Gemelli and the Ciccione proved grey mud breccias (diamicts containing angular sedimentary clasts to cobble size) to lie at or near seabed, while gas was observed escaping from some cores, suggesting active mud volcanism.

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