C. Violante [(1)], M. Sacchi [(1)], A. Cinque [(2)], E. Esposito [(1)], S. Porfido [(1)], T. Toth [(3)] and E.Vittori [(4)]

[(1)] IAMC-CNR Calata Porta di Massa, Napoli, Italy
[(2)] Dip. Scienze della Terra, Univ. "Federico II", Napoli, Italy
[(3)] Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici (APAT), Roma, Italy
[(4)] Eötvös Lorand University, Budapest, Hungary

GEOPHYSICAL INVESTIGATIONS AND UNDERWATER ARCHAEOLOGY: THE DEBATED CASE OF AMALFI SOMMERSA (AMALFI COAST, SOUTHERN ITALY)

The Amalfi coast is located on the southern flank of the Sorrento peninsula, west of Salerno (southern Italy). It is a steep rocky coast developed in a northeast-southwest direction, separating the Bay of Naples to the north from the Bay of Salerno to the south. This structure is the top of a submerged monocline dipping towards the northwest and southwards bordered by normal faults, with a northeast-southwest orientation. It is mainly composed of Mesozoic limestone and syn-orogenic Miocene siliciclastics tectonically uplifted since the Early Pleistocene. The sedimentary cover includes Quaternary volcaniclastic and alluvial deposits, which form a discontinuous mantle overlying the carbonate bedrock, prone to detachment during hydrological events. The geological structure also controls the pattern of drainage of the study area. This is characterized by ephemeral streams with high-elevation drainage areas, high-gradient transfer zones and main delivery areas into the adjacent marine shelf.

Since historical time, human settlements are mainly located along the coast at the mouth of the larger streams, where water resource, low topographies and natural embayment for ship recovery occur. Besides sparse pre-historical sites, maritime villas of roman age are present at Minori, Amalfi, Positano and Gallo Lungo. The only documented roman village was the one of Marcina (at present Vietri sul Mare) where remnants of a thermal structure are still visible. Nevertheless, this area reached his maximum opulence during the middle age (VI-XI centuries), when Amalfi became the first of the Italian *Repubbliche Marinare* with commercial activities all over the Mediterranean basin and acquired a remarkable political and military power. Since the 1997 it has been included in UNESCO's List of World Heritage Sites being considered as an outstanding example of a Mediterranean landscape, with exceptional cultural and natural scenic value resulting from its dramatic topography and historical evolution.

In this work we use high-resolution marine geophysical techniques to investigate submerged structures located in the Amalfi port (Salerno, southern Italy) developing at the mouth of stream Canneto. The marine surveys, still in progress, include seismic reflection investigations performed with a subbottom (boomer) source (SEISTEC system), swath bathymetry and backscatter mapping. Groundtruth control is provided by diving inspections. As reported by historical sources (Gargano, 1997) the submerged objects may be referred to the claimed *Amalfi Sommersa*; part of the medieval Amalfi port now located at depth ranging from –3 and –∑7 meters. In particular, sedimentological and petrophysical analyses carried out on gravity cores collected in the Salerno Bay, and seismic facies interpretation of ca. 150 km of high-resolution subbottom Chirp lines enabled the recognition of major sea storm events (Budillon et al., in press). This finding well match with information reported by

historical sources. Based on this, we assumed as an initial hypothesis that one of these events triggered a landslide phenomenon which disrupted the studied structures during high-medieval time.

The above reported high-resolution seismic investigations allowed to characterize some of the submerged structures. The SEISTEC system operated at 3.1 kV and 150 J with a firing rate of 4 shots/sec enabling a sub-metric resolution. A semicircular structure surveyed just seaward the main jetties in the Amalfi port (Fig. 1) was identified as an artefact formed by a boulder accumulation with “anthropic” signatures. This is an East-West oriented structure (Bergman, 1977) showing no connections with the mainland and acoustically individuated by a typical hummocky facies. Moreover, different inclination and acoustic facies detected in the seabed located just landward of such a structure with respect of that developing seaward suggest a damming effect for fluvial sands deposited by the stream Canneto. According with historical information, we refer the surveyed artefact to the remnants of a medieval pier probably subsidized by the Cardinal Pietro Capuano around the XIII century. Other structures located in the western sector of the Amalfi port will be investigated next, even if some of them can be interpreted as substrate deposits cropping out at seafloor.

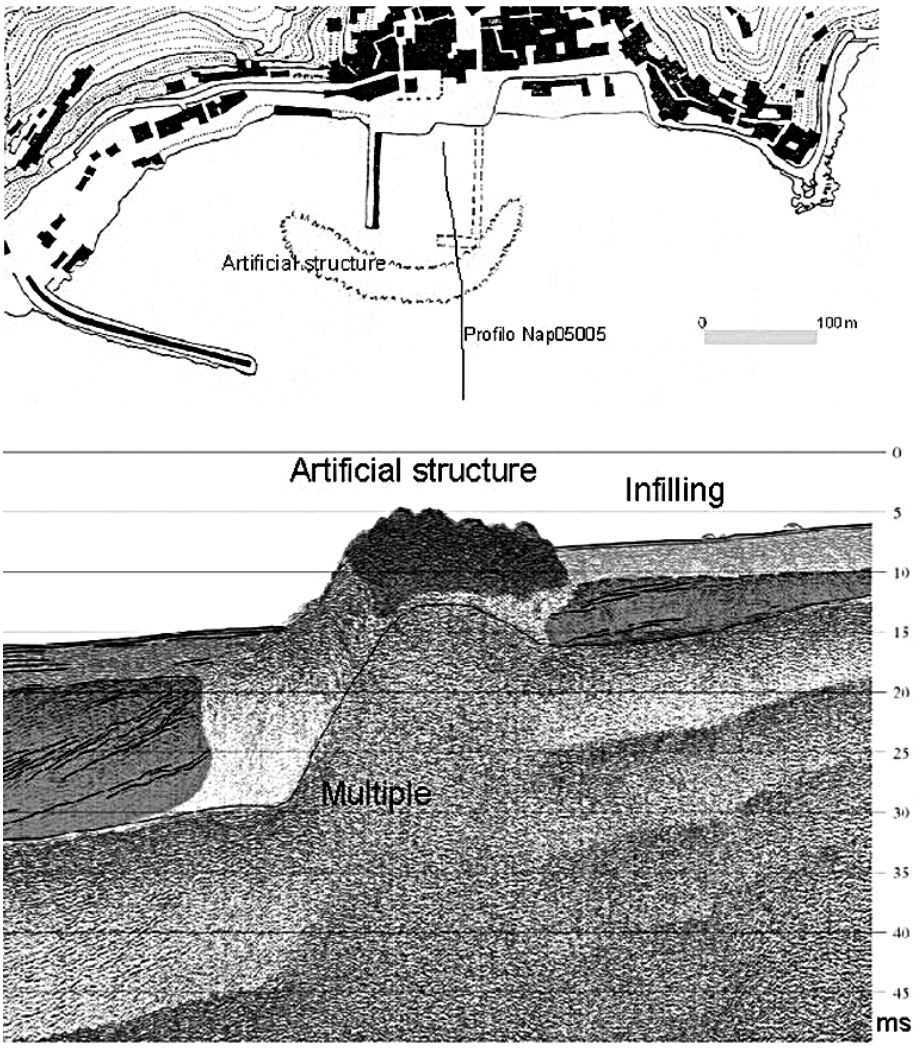

Fig. 1 - Esempio di radargramma: le principali riflessioni sono evidenziate nel box.

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