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Potential micro-tsunamis by submarine landslides along the Calabro Ionian margin: 3D case study simulation applied to Cirò Marina coast (Calabria, Southern Italy).

Vincenzo Di Fiore (1,3), Lucio Amato (2,3), Giuseppe Cavuoto (1), Michele Punzo (1), Giovanni Antonucci (2,3), Davide Sala (2,3), Ennio Marsella (1,3)

(1) ISTITUTO PER L'AMBIENTE MARINO COSTIERO, CONSIGLIO NAZIONALE DELLE RICERCHE (IAMC-CNR), CALATA PORTA DI MASSA (INTERNO PORTO DI NAPOLI), 80133 NAPOLI, ITALY, (2) TECNO IN SPA, II TRAV. STRETTOLA S. ANNA ALLE PALUDI, 11, 80142 NAPOLI, ITALY, (3) URT OPEN MARINE LAB – CONSIGLIO NAZIONALE DELLE RICERCHE, II TRAV. STRETTOLA S. ANNA ALLE PALUDI, 11, 80142 NAPOLI, ITALY

The Calabria's Ionian continental margin is characterized by an extremely narrow continental shelf and by an very steep continental slope (up to 20 degrees).
The continental slope is deeply incised by canyons which drain the massive continental sedimentary supply. The canyon heads are quite large and consist of numerous tributaries generally affecting the shelf break. The canyons are deep, with high slope gradient, high sinuosity indexes and their heads have a marked dendritic morphology reaching a few hundred meters from the coastline. These canyons are characterized by V-shape cross-sections in their upper parts and U-shape cross-sections in their terminal parts.
These conditions are favorable to sediment buildup on the narrow continental shelf and therefore, under seismic action it may give rise to submarine landslides.
In this study, we propose a 3D numerical modeling of tsunami waves generated by an underwater slump with "Geowave" software. The simulated gravity instability zone is near the "Venere 1" head Canyon situated close Cirò Marina coastal area. The availability of a detailed bathymetric map both with a good knowledge of the local geology allowed us to obtain reliable simulation results.
Interesting results of tsunami simulation, in the above-mentioned shoreline areas, show that the amplitude of wave run-up ranges from 0.50 m up to 0.90 m. This difference in run-up is ascribed to the directional effects and to the different coastal morphology.