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A new multidisciplinary observatory in the Eastern Ligurian Sea (NW Mediterranean Sea): a combination of deep-sea and coastal measurements

Tiziana Ciuffardi[1], Maristella Berta[2], Andrea Bordone[1], Mireno Borghini[2], Paolo Celentano[2], Luca Cocchi[3], Letizia De Fabritiis[4], Ivana Delbono[1], Roberta Delfanti[1], Maurizio Demarte[5], Roberta Ivaldi[5], Zoi Kokkini[2], Marina Locritani[3], Davide Marini[4], Simone Marini[2], Filippo Muccini[3], Federica Pannacciulli[1], Andrea Peirano[1], Giancarlo Raiteri[1], and Anna Vetrano[2]

[1]Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile, La Spezia, Italy (tiziana.ciuffardi@enea.it)

[2]Consiglio Nazionale delle Ricerche-Istituto di Scienze Marine, La Spezia, Italy

[3]Istituto Nazionale di Geofisica e Vulcanologia, Sezione Roma 2, Roma, Italy

[4]Distretto Ligure delle Tecnologie Marine, La Spezia, Italy

[5]Istituto Idrografico della Marina, Genova, Italy

Climate change investigation, protection of marine ecosystems and mitigation of natural risks are the main research objectives of the Levante Canyon Mooring (LCM), a deep submarine multidisciplinary observatory, installed in September 2019 in the Eastern Ligurian Sea (Lat 44°05.443'N, Long 009°29.900'E at 608 m depth), inside the Pelagos Sanctuary. The observatory consists of a stand-alone station, with an instrumented mooring line ending with a submerged buoy. It operates in delayed-mode and is equipped with sensors that measure physical and biogeochemical parameters continuously and it is expected to provide data in the long-term. Temperature and salinity monitoring is carried out at three depth levels (about 80, 335 and 580 m depth), while turbidity is recorded at 580 m depth. LCM is also equipped with a sediment trap and two acoustic current profilers, able to measure direction and speed of currents in nearly the entire water column.

Data will be used to measure flux of sediments, nutrients and organic matter and to better understand the hydrodynamic and physical conditions of the Levante Canyon, which hosts valuable and vulnerable ecosystems, such as the deep-living cold-water corals, identified by IIM and ENEA in 2014, near the LCM mooring site. The LCM site is also located in an area where surface currents are monitored in near-real time by the CNR's High Frequency Radar network, allowing data integration from multiplatform observations.

The project, co-financed by the Liguria Region, is coordinated by the DLTM in strict collaboration, in terms of human resources, infrastructures and instruments with the associated public research bodies (CNR, ENEA, INGV) and with the IIM. The project also includes the next deployment of a cabled station in the Gulf of La Spezia (10 m depth, less than 100 m far from the coast) that will

monitor the gravimetric field, temperature and marine current. The main objective of the coastal station is to provide a test site for new instruments and sensors.

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