

International workshop. Cetacean echolocation and outer space neutrinos:
ethology and physics for an interdisciplinary approach to underwater
bioacoustics and astrophysical particles detection



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Positioning System for neutrino telescopes: SMO and KM3NeT-Italia in Capo Passero

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The KM3NeT-Italia project, led by the INFN, is building the first block of the forthcoming KM3NeT underwater neutrino telescope (www.km3net.org). A prototype detection unit has been deployed the 23rd March 2013. It consists of a vertical sequence of 8 horizontal structures called floors, kept vertical by appropriate buoyancy on the top and follows the tower layout. The tower has been installed at a depth of 3500 m, about 90 km offshore the village of Capo Passero (Sicily), where the KM3NeT telescope will be installed. The unit hosts the SMO detector an array of 12 acoustic sensors continuously sampled underwater at 192kHz /24 bit and transmitted to shore. The array permits real-time study of acoustic biological sounds and acoustic background monitoring. However the main goal of SMO is provide, acoustically, the position of the mechanical unit underwater. The underwater acoustic positioning is performed also through a Long Base Line (LBL) of acoustic beacons anchored on sea-floor at about 400 m from the tower. The acoustic signals emitted by the beacons are acquired by the SMO array and sent to shore through electro-optical cable. All SMO receivers are phased and synchronized by a common master clock and data are time-stamped underwater with GPS time. The results of the underwater acoustic positioning will be presented. SMO is also a test-bench for sensors and electronics technologies for acoustic systems of the future KM3NeT telescope.

Primary authors: Ms LAROSA, Giuseppina (LNS); Mr VIOLA, Salvatore (LNS)

Presenter: Ms LAROSA, Giuseppina (LNS)

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