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Sperm whale assessment in the Western Ionian Sea using acoustic data from deep sea observatories

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The Italian National Institute of Nuclear Physics (INFN) operates two deep sea infrastructures: Capo Passero, Western Ionian Sea 3,600 meters of depth, and Catania Western Ionian Sea 2,100 m depth. At the two sites, several research observatories have been run: OnDE, NEMO-SN1, SMO, KM3NeT-Italia most of them jointly operated between INFN and INGV. In all these observatories, passive acoustic sensors (hydrophones) have been installed. Passive Acoustics Monitoring (PAM) is nowadays the main tool of the bioacoustics to study marine mammals. In particular, receiving the sounds emitted by cetaceans from a multi-hydrophones array installed in a cabled seafloor observatory, a research about the ecological dynamics of the species may be performed. Data acquired with the hydrophones installed aboard the OnDE, SMO and KM3NeT-Italia observatories will be reported. Thanks to acquired data, the acoustic presence of the sperm whales was assessed and studied for several years (2005:2013). An "ad hoc" algorithm was also developed to allow the automatic identification of the "clicks" emitted by the sperm whales and measure the size of detected animals. According to the results obtained, the sperm whale population in the area is well-distributed in size, sex and sexual maturity. Although specimens more than 14 meters of length (old males) seem to be absent.