

International workshop. Cetacean echolocation and outer space neutrinos:
ethology and physics for an interdisciplinary approach to underwater
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A Calibrator for UHE neutrino acoustic detection in underwater telescopes

Underwater neutrino telescopes require in situ acoustic calibration in order to assure the optimal performance of sensors dedicated for the acoustic detection of ultra-high energy neutrinos. Moreover, sensor calibration is necessary to evaluate the acoustic detection and the efficiency of the entire detection. A first prototype of a compact acoustic array able to mimic the acoustic neutrino signal, this is a transient bipolar signal with 'pancake' directivity, is presented. Parametric acoustic source technique has been used to reproduce the neutrino signal with those characteristics. The compact array developed has practical features such as easy handling and operation, and versatile functionality. In the latter sense, the transmitter is able to work in different frequency ranges for different application modes, and thus to carry out several tasks related to acoustics in underwater neutrino telescopes: emission of neutrino-like signals, calibration of sensor sensitivities and responses, emission of signals for positioning, etc. The design process, construction and characterization of the prototype are detailed. A theoretical study is also discussed, where experimental signals were propagated over distances in the kilometre range. A test plan is proposed for testing the device in a Sea Campaign.

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