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Compact array calibrator for UHE neutrino acoustic detection

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In situ acoustic calibration devices should play a very important role to assure the right performance of sensors and detectors for the acoustic detection of ultra-high energy neutrinos in underwater telescopes. Moreover, they provide evidences for the feasibility evaluation of the technique and for the efficiency determination of the entire detector. Following previous studies, relating with parametric acoustic generation, a first prototype of a compact acoustic array able to mimic the acoustic neutrino signal (a very directive transient bipolar signal with 'pancake'directivity) is presented. The compact array developed has practical features such as easy handling, operation and versatile functionality. The transmitter is able to work in different frequency ranges, for different application modes, being possible to carry out several tasks related with acoustics in underwater neutrino telescopes: emission of neutrino-like signals, calibration of sensor sensitivities and responses, emission of signals for positioning, etc. The design, construction and characterization of the prototype are described. A propagation simulation study of experimental signals over km distances is also discussed.

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