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Abstract = Authors: Ulf Fritsch for the ANTARES Collaboration
Title: Calibration of the ANTARES neutrino telescope
ANTARES, the first undersea neutrino telescope in the Mediterranean Sea, has been completed in May 2008. To reconstruct neutrino induced muon tracks in water the time and amplitude information of the emitted Cherenkov light detected by almost 900 photomultipliers is evaluated. The knowledge of the individual transit times of PMTs and of the delays due to the detector setup is required. Transit time measurements can be done in-situ by flashing LEDs inside an optical module (OM). By flashing groups of 36-LED optical beacons (LOB) distributed across the detector volume and monitoring arrival times of light emitted by these LOB at the OMs a precise calibration of the individual delays from the PMT associated electronics is possible. As the detector units are mounted on flexible strings and the detector is exposed to sea currents, real-time positioning is needed. Measuring local tilts and headings with tiltmeters and compasses and the relative positions of five hydrophones per string by triangulation using transit times of acoustic waves, the shape of each string can be reconstructed. This talk will give an overview of the hardware and software components for the in-situ detector calibration and will report results on the achieved precision.