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## Tests and calibration of detector strings for the KM3NeT/ARCA neutrino telescope

KM3NeT is a network of underwater Cherenkov neutrino telescopes currently under construction at two sites in the Mediterranean Sea. ARCA, located offshore the Sicilian Coast (Italy), is optimized for the detection of high energy cosmic neutrinos, while ORCA situated off the coast of Toulon (France), is designed for studying atmospheric neutrinos.

Both detectors consist of vertical strings, called Detection Units (DUs), each comprising of 18 optical modules (Digital Optical Modules - DOMs). Each DOM houses 31 3-inch photomultiplier tubes (PMTs), along with electronics for readout, data transmission, power supply and control. The data acquisition system of KM3NeT employs a triggerless streaming readout scheme, where the DOMs act as underwater nodes transmitting all data and communicating with the shore station via a network of optical fibers.

To optimise the event direction reconstruction of the telescopes, the DOMs are synchronized to  $O(1)$  ns accuracy using the White Rabbit time synchronization protocol, while their locations underwater are known with accuracy  $O(20)$  cm at any time using a custom acoustic positioning system.

Following the first phase of DU construction, which relied on a customized version of the White Rabbit protocol, a new network architecture following the standard White Rabbit protocol has been implemented to improve the maintainability and scalability of the system.

This contribution, describes the setup, procedure and protocols adopted to test the ARCA Detection Units under the standard White Rabbit configuration in the laboratory. Specifically, the instrumentation for optical, acoustic and data readout systems, as well as the time calibration measurements performed enduring the final stage of the DU integration to validate the detector strings under real operating conditions prior to their final installation in the sea bed.

### Collaboration(s)

KM3NeT Collaboration

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