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The new KM3NeT Detection Units

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KM3NeT is a distributed, deep-sea, Cherenkov neutrino observatory under realization in the Mediterranean Sea with two detectors: ARCA, for neutrino astronomy close to Italy, and ORCA, for studying the neutrino oscillations close to France. Each detector is made of a large tridimensional array of optical modules, connected and controlled from a remote shore-station. Each optical module is a submarine node of an extended ethernet network, comprising the onshore computing resources for the online collection and filtering of the acquired data. The data acquisition system follows the trigger-less streaming readout paradigm, with a modular and scalable design which allowed the KM3NeT Collaboration to take data since the very first stages of installation. After the first phase of construction, we improved the connectivity of the optical modules, by adding new layers of data aggregation directly at the detector. This was achieved by means of White Rabbit switches with a readapted form-factor, fitting the KM3NeT underwater vessels. We refer to them as "Wet" White Rabbit switches, in relation to their "Dry" counterparts, in the shore-stations.
Wet and Dry White Rabbit switch-fabrics allow also to distribute the timing to the optical modules with the required nanosecond accuracy, according to the standard White Rabbit protocol developed at CERN. In this presentation we review the evolution of the KM3NeT Detection Units, focusing on the recent changes in the architecture, manufacturing and testing processes.

Collaboration

KM3NeT

Role of Submitter

I am the presenter

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