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Design and construction of the first P-ONE detector line

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Astrophysical neutrinos at the TeV scale would open a new observational window into currently obscured and inaccessible extreme environments, such as the centre of other galaxies. Detecting them poses significant challenges due to their low rate and weak interactions with matter. The Pacific Ocean Neutrino Experiment (P-ONE) addresses this problem by instrumenting a large volume of water at a depth of 2.6 km in the Northeast Pacific Ocean, profiting of a large oceanographic infrastructure maintained by Ocean Networks Canada. The ocean water will be used as a detection medium for the Cherenkov light emitted by the charged secondary particles produced by a neutrino interaction at TeV and above. This is done using an array of photomultiplier tubes encapsulated in glass hemispheres. A total of 20 hemispheres are mounted on a kilometer-high mooring line and read out by a newly designed data acquisition system that ensures sub-nanosecond timing, which is critical for correlating and reconstructing signals across the detector array. This talk will provide an overview of the design and current status of the first mooring line, focusing on its construction, operation and the measurements taken to ensure proper functionality of all its subsystems.

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