

A multi-PMT photodetector system for the Hyper-Kamiokande experiment

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Hyper-Kamiokande (Hyper-K) is the next generation large volume water Cherenkov detector to be built in Japan. The fiducial volume will be approximately 8 times larger than its precursor Super-Kamiokande.

Its broad physics program includes nucleon decay, neutrinos from astronomical and accelerator neutrinos, with the main focus to determine the leptonic CP violation.

In order to detect the weak Cherenkov light generated by neutrino interactions or proton decay, a system of small photomultipliers as implemented in the KM3NeT experiment, the so called multi-PMT module (mPMT), is considered as an option to improve Hyper-K physics capability.

A mPMT Optical Module based on a pressure vessel instrumented with multiple small diameter photosensors, readout electronics and power, offers several advantages as increased granularity, reduced dark rate, weaker sensitivity to Earth's magnetic field, improved timing resolution and directional information with an almost isotropic field of view.

In this contribution the development of a mPMT module for Hyper-K and the prospects for physics capabilities with a hybrid configurations of the photosensor system with 20^3 PMTs and mPMTs will be discussed.

I read the instructions

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2

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