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Large scale measurement of the performance of the Hyper-Kamiokande 50cm PMT

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Hyper-Kamiokande is the next generation Water Cherenkov experiment in Japan, which will study with unprecedented precision the oscillations of different types of neutrinos, as well as neutrinos of astrophysics origin. The inner part of this massive new detector will be instrumented with 20000 high precision photomultiplier tubes (PMT). The R12860 PMT was developed by Hamamatsu Photonics for the Hyper-Kamiokande project, and has improved timing resolution, detection efficiency and charge resolution compared to the model used in the current Super-Kamiokande experiment. The mass production of these PMTs is on-going, and as part of the quality assurance process of Hyper-Kamiokande, a fraction of them are measured over one month periods in two specially built setups to evaluate their performance, check they satisfy the requirements of the experiment and detect any possible variation of the production quality during mass production. In particular, one of the setups allows us to measure the dark rate, after-pulse, timing and charge resolution of 16 PMTs at a time, as well as evaluate the stability of the PMTs performance over one month. The regular measurements done during the mass production provide large statistics measurements to characterize the performance of the R12860 PMT. We will present the results of the measurements in this poster, together with the setups used.

Poster prize

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