

Preparation of large aperture Photo-Detectors for the Hyper-Kamiokande

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Hyper-Kamiokande is a large water Cherenkov detector in Japan to explore various neutrino physics and discover a nucleon decay. Its construction started in 2020 and the mass production of a large aperture photo-detector is planned from the end of 2020. We developed a photomultiplier tube (PMT) with a 50 cm diameter, R12860 by Hamamatsu Photonics K.K. and installed over a hundred of them into Super-Kamiokande. A hundred PMTs were evaluated in Super-Kamiokande and compared with an R3600 PMT for Super-Kamiokande. It was confirmed that the resolutions and detection efficiency are doubly improved. A noise reduction of the PMT was also achieved with suppressing radioactive contaminations in the glass. In addition, another large aperture photodetector using a micro channel plate was developed. A part of the detection wall with the optical acrylic window and several designs of a shockwave prevention cover are constructed for a test to demonstrate a coming construction work. A PMT calibration facility is also under preparation. We present the recent development and improved performance of the large-aperture photo-detectors.

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