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(G*) A Multi-Photomultiplier Photosensor Module for IWCD/Hyper-K

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Hyper-K will be a next-generation long-baseline neutrino experiment in Japan with the main goal of measuring the neutrino flavour mixing parameters and discovering CP violation in the neutrino sector. Its detector complex will benefit from the construction of the Intermediate Water Cherenkov Detector (IWCD). The IWCD will measure the un-oscillated neutrino flux at different off-axis angles, providing a considerable decrease in the systematic uncertainties associated with the extrapolation of cross-sections to the far Hyper-K detector. To accomplish this with optimal efficiency, a high granularity photo-detector system, called multi-PMT (mPMT), is proposed. Each mPMT module will consist of nineteen 3"photo-multiplier tubes (PMT) and a scintillator plate housed under a transparent dome in a cylindrical body. The smaller and fast PMTs will provide a better granularity and time resolution than the standard 20" PMTs used in the Super-Kamiokande detector, allowing better particle identification and trajectory reconstruction. The scintillator plates will work as a veto system for undesired processes. In this talk, I will address the technical challenges and developments towards the construction of the mPMT system.

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