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## **(G\*) (POS-37) Toward a Veto Mechanism to Reduce Background for the Hyper-Kamiokande's Intermediate Water Cherenkov Detector**

*Tuesday, 7 June 2022 17:50 (2 minutes)*

Hyper-Kamiokande (HK) will be a next-generation neutrino detector. Following the successful T2K experiment, it will use a long-baseline neutrino beam to study neutrino oscillation and discover CP-phase violation in the lepton sector, among other goals. To characterize the unoscillated neutrino beam, the upcoming Intermediate Water-Cherenkov Detector (IWCD) will intercept the neutrino beam at different off-axis angles using a multi-Photomultiplier Tube (mPMT) system to detect Cherenkov light produced by charged particles resulting from neutrino interactions in the detector. However, the neutrino beam can also interact with the soil and water surrounding the IWCD, generating a background of penetrating particles, such as pions, photons, muons and electrons, that may interfere with the desirable neutrino-event detection. To reduce the effects of such background a veto mechanism is required. At the bottom of the mPMT module, a scintillator plate will generate a hit when traversed by a background particle, which, as part of a time-coincidence circuit with other detectors at the outer region of IWCD, will help us veto undesired particles. In this presentation, I will describe the conceptual considerations and experimental developments toward an optimal design for the mPMT's scintillator plates, and simulation efforts toward understanding its integration with the general IWCD's background-reducing mechanism.

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