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## Precision measurements of photosensor components for the Hyper-Kamiokande Outer Detector

*Saturday, 9 July 2022 12:15 (15 minutes)*

Hyper-Kamiokande (HK) will be a next generation water Cherenkov detector capable of measuring neutrino interactions with unprecedented statistical precision. Discriminating candidate neutrino interactions from cosmic-ray muons and low-energy backgrounds is dependent upon constructing an effective Outer Detector (OD). The baseline design proposes deploying up to ten thousand 3-inch high-sensitivity photomultipliers each coupled to an acrylic wavelength shifting (WLS) square plate. Sophisticated optical measurements using a high-powered laser setup have improved on existing absorbance results and demonstrated a previously unknown artifact of Mie Scattering present in all candidate WLS samples. Results from a new test facility (Baby-K) designed to evaluate the light collection efficiency of all WLS plates via their response to cosmic muons in ultra-pure water will also be presented. This talk will provide an overview of the R&D effort ongoing in Oxford to optimise the OD photosensor design, including the latest water and air-based measurements of WLS samples in combination with detailed simulation studies carried out in GEANT4.

### In-person participation

Yes

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