



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 452

(Étudiant(e) du 1er cycle)

Type: **Poster Competition (Undergraduate Student) / Compétition affiches**

(U*) POS-C14 – Hyper-Kamiokande Photosensor Test Facility Recommissioning and System Upgrades.

Wednesday 9 June 2021 13:55 (2 minutes)

The Hyper-Kamiokande (Hyper-K) experiment is the next generation of the Super-Kamiokande (Super-K) and T2K experiments investigating a breadth of physics topics including neutrino oscillation. The Hyper-K far-distance detector will contain ~40,000 20" photomultiplier tubes (PMTs), while the Intermediate-distance Water Cherenkov detector (IWCD) will contain ~500 multi-PMTs (each containing 19 3" PMTs). To minimize systematic errors in their measurements, a precise understanding of the PMTs' intrinsic parameters, such as their detection efficiency and timing as a function of the incident photon position and angle, as well as their response to variations in magnetic field, is required.

These parameters can be measured at TRIUMF's photosensor test facility (PTF). This facility characterizes PMTs by emitting a laser beam from robotic arms that enable fine control of the beam's 3D position and orientation. The light wavelength and polarization can also be varied to mimic Cherenkov light. Additionally, the facility uses 6 Helmholtz coils to create and control the magnetic field.

Currently, the PTF is being recommissioned in a new location, farther from the magnetic interference of the on-site cyclotron. This poster will outline the software, hardware, and mechanical upgrades being implemented to improve the facilities robustness and the stability and accuracy of the measurements. These upgrades include mechanical modifications to simplify the process of inserting and removing the PMTs as well as the implementation of motor encoders, environmental sensors, and software to prevent collisions of the robotic arms during reflectivity measurements. Moreover, this poster will cover the modelling and measurement of the environmental magnetic field in the facility to reduce the time required to complete the magnetic field compensation process.

Author: WINGFELDER, Skylar (TRIUMF)

Presenter: WINGFELDER, Skylar (TRIUMF)

Session Classification: W-POS-C #9-16 Poster session (DAPI) / Session d'affiches (DPAI)

Track Classification: Applied Physics and Instrumentation / Physique appliquée et de l'instrumentation (DAPI / DPAI)