



Canadian Association  
of Physicists

Association canadienne  
des physiciens et physiciennes

Contribution ID: 24 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

## **(G\*) Super-Kamiokande PMT characterizations using artificial magnetic field and robotic laser-equipped arms**

*Thursday, June 10, 2021 11:45 AM (10 minutes)*

Super-Kamiokande (Super-K) is a neutrino detector located in Japan used to study neutrinos from different sources (atmospheric, solar, supernovae and accelerator). Its research program includes search for proton decay and measurement of neutrino oscillations among others. It contains ~11,000 20 inches photomultiplier tubes (PMTs) surrounding a massive tank filled with 50 ktonne of ultra-pure water. A detailed understanding of the PMTs, as well as their response to environmental effects, is necessary for a precise understanding of the detector and consequent reduction of systematic uncertainties. This is also a very important contribution towards the future Hyper-Kamiokande detector which will be instrumented of ~40,000 PMTs, helping realize the best design, monitoring and calibration methods needed to achieve maximum sensitivity of the experiment.

I will present the measured non-uniformity of the PMT used in Super-K as well as the effects of the magnetic field on the PMT parameters. Moreover, I will describe the recent facility upgrades (motion monitoring, magnetic field simulation) implemented to improve the accuracy and reproducibility of the measurements along with a better understanding of environmental variables that can lead to undesired systematic uncertainties.

**Author:** GOUSY-LEBLANC, Vincent (University of Victoria)

**Presenter:** GOUSY-LEBLANC, Vincent (University of Victoria)

**Session Classification:** R1-8 Test Facility II (PPD) / Installations pour tests II (PPD)

**Track Classification:** Particle Physics / Physique des particules (PPD)