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# Super-Kamiokande PMTs Characterizations Using Artificial Magnetic Field and Robotic Laser-Equipped Arms

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Super-Kamiokande is a neutrino detector in Japan containing 11,000 photomultiplier tubes (PMTs) surrounding a massive tank filled with 50 ktonne of ultra-pure water. The single-photon sensitive PMTs detect Cherenkov radiation produced by charged particles travelling faster than the speed of light in 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 even more importantly for the future Hyper-Kamiokande detector made of 40,000 PMTs.

One of the effects we need to understand is the response to the varying Earth geomagnetic field in the detector. The photon detection efficiency and timing of the PMT are affected by magnetic fields due to the resultant trajectory of the photo-electrons induced by Cherenkov light. A photosensor test facility (PTF) at TRIUMF consisting of laser-equipped robotic gantry arms is used to characterize PMTs.

I will discuss the procedure to control the magnetic field, environmental systematics, and the motion and monitoring of the gantries. Moreover, I will show the effect of the magnetic field on 3 parameters of the PMT: the gain, transit time and detection efficiency.

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## Please select: Experiment or Theory

Instrumentation

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