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Progress on the Hyper-Kamiokande multi-Photomultiplier Tubes and the Water Cherenkov Test Experiment

Saturday, 15 February 2025 09:00 (15 minutes)

The Hyper-Kamiokande (Hyper-K) project plans to measure the phenomenon of neutrino oscillations with high precision, which may give us unprecedented insight into the matter-antimatter asymmetry in our universe. For this measurement, multiple water Cherenkov detectors will be deployed that will use a new detector technology called multi-photomultiplier tubes (mPMTs). These mPMTs each consist of nineteen 3”PMTs for the detection of Cherenkov radiation produced by the resultant charged particle in a neutrino interaction. This new technology is currently being tested in the Water Cherenkov Test Experiment (WCTE) at CERN, where charged particles and gamma-rays are injected into a detector filled with 97 mPMTs. The WCTE is a scaled-down version of the detectors that will be used in the Hyper-K experiment, and so its findings will be crucial to achieving the full physics potential of Hyper-K. This presentation will discuss the development and testing of the mPMT modules, as well as provide an overview of the WCTE, its current status, and the physics goals we look to achieve with it.

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