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An Intermediate Water Cherenkov Detector for the T2K and Hyper-K Experiments

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The Japan based long baseline neutrino program aims for the discovery of CP violation in neutrino mixing and precision measurements of neutrino oscillation parameters at the T2K and Hyper-K experiments. Achieving these goals will require the collection of large data sets and the reduction of systematic uncertainties to the few percent level. Dominant systematic errors arise in the modeling of (anti)neutrino-nucleus interactions in water, and these errors can be reduced with measurements in an intermediate water Cherenkov detector located near the neutrino source at J-PARC. To this end, intermediate water Cherenkov detectors such as NuPRISM and TITUS have been proposed. These detectors include features such as an off-axis angle spanning configuration to measure the energy dependence of neutrino interactions and Gd loading to measure final state neutron multiplicities in neutrino interactions. In this talk, we present a unified program for intermediate water Cherenkov detectors in the J-PARC neutrino beam that supports that physics programs of T2K and Hyper-K.

Experimental Collaboration

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