

TITUS: An Intermediate Distance Detector for the Tokai-to-Hyper-Kamiokande Neutrino Beam

The Tokai Intermediate Tank for Unoscillated Spectrum (TITUS) detector is a proposed addition to the Hyper-Kamiokande (Hyper-K) experiment, located approximately 2 km from the J-PARC neutrino beam. The design consists of a 2 kton Gd-doped water Cherenkov tank, surrounded by a magnetized iron detector designed to range-out muons. The target material and location were chosen so that the neutrino interactions and beam spectrum at TITUS would match those of Hyper-K. Including a 0.1% Gd concentration allows for nu/antineutrino discrimination via neutron tagging. The primary goal of TITUS is to make cross-section measurements that reduce the systematic uncertainty of the long-baseline oscillation physics program at Hyper-K and enhance its sensitivity to CP violation. TITUS can also be used for physics unrelated to the J-PARC beam, functioning as an independent detector for supernova neutrino bursts and measuring the neutron rate to improve Hyper-K proton decay searches.

WG3: Accelerator Physics (Yes/No)

No

WG2: Neutrino Scattering Physics (Yes/No)

No

WG4: Muon Physics (Yes/No)

No

WG1: Neutrino Oscillation Physics (Yes/No)

Yes

Type of presentation

Poster

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