



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3059

Type: Oral (Non-Student) / Orale (non-étudiant(e))

Constraints on electron neutrino and antineutrino cross sections for the leptonic CP violation search at Hyper-Kamiokande

Wednesday, 8 June 2022 11:15 (15 minutes)

The Hyper-Kamiokande (HK) experiment will study long-baseline neutrino oscillations and search for the CP violation in the lepton sector, following the successful T2K experiment. An upgraded 1.3MW beam produced at J-PARC 30 GeV proton accelerator and a 184 kiloton of the far detector's fiducial mass will be used, resulting in about 20 times higher interaction rate than that of T2K. The CP violation search will be systematically limited predominantly due to the uncertainties on electron (anti) neutrino cross sections for water target. To control the uncertainties and make full use of the high data statistics, it is planned to build an intermediate water Cherenkov detector (IWCD) that will be a sub-kiloton scale detector to be located at about 1km from the neutrino source as one of the HK's near detectors. The detector is designed to be able to move vertically, in order to change the energies of the neutrinos impinging the detector. Collecting data at different vertical positions enables IWCD to study the relationship between the neutrino energies and the observables from neutrino interactions. This talk will detail the constraints on the electron (anti) neutrino cross-sections at IWCD, which have been developed specifically for the CP violation study.

Primary author: Dr AKUTSU, Ryosuke (TRIUMF)

Presenter: Dr AKUTSU, Ryosuke (TRIUMF)

Session Classification: W1-1 Neutrino Experiments (PPD) | Expériences de neutrinos (PPD)

Track Classification: Technical Sessions / Sessions techniques: Particle Physics / Physique des particules (PPD)