

Seminarium Szkoły Doktorskiej NCBJ

Thursday, 16 December, 9:00

<https://www.gotomeet.me/NCBJmeetings/phd-seminar>

Speaker:

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Title:

Development of a multiring electron neutrino sample at the T2K far detector

Abstract:

The Tokai to Kamioka (T2K) experiment is a long-baseline accelerator neutrino experiment that measures electron neutrino appearance and muon neutrino disappearance from a muon neutrino beam by observing neutrino events at the near and far detectors. T2K uses the Super Kamiokande (SK) as the far detector, which is a 50-kilo ton water-Cherenkov detector that observes Cherenkov rings from charged particles produced in neutrino interactions with water.

In the present oscillation analyses, T2K uses only single-ring electron neutrino events detected at SK. These single-ring events are dominated by charged current quasielastic interactions. Charged-current single pion events form the second most dominant signal events in electron neutrino appearance studies. In this mode, there can be two rings coming from electron and charged pion if the latter has a momentum above the Cherenkov threshold. The sample with no ring from the charged pion is already included in the oscillation analysis.

My study is aimed at developing selection cuts for including the sample with two Cherenkov rings. Being the second most dominant signal event, its inclusion in the samples can increase the statistics of electron neutrino events at SK and possibly improve sensitivity to the CP violation phase.