

New features in the T2K Near Detector constraints for the Oscillation Analysis

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T2K (Tokai to Kamioka) is a Japan-based long-baseline neutrino oscillation experiment designed to measure (anti)neutrino flavor oscillations. A muon (anti-)neutrino beam peaked around 0.6 GeV is produced in Tokai and directed toward the water Cherenkov far detector Super-Kamiokande (SK) located at 295 km. The ND280 is used to characterise the neutrino beam before the oscillation, and its data are used to tune the neutrino flux and cross-section models which are then used to predict the expected number of neutrinos at SK. In this poster, I will present the status of an updated analysis of the near detector (ND280) data, counting numerous improvements as a new selection ensuring to cover a wider phase space of the outgoing muons, with a better characterization of the low momentum transfer regions, improved events reconstruction, near-detector modeling, and cross-section modeling. GUNDAM, which stands for Generic fitter for Upgraded Near Detector Analysis Method, is a new tool developed to measure the neutrino flux and cross-section at the T2K near detector. It consists of a suite of applications interfaced to a flexible and highly optimized code structure. I will discuss briefly its features and performance, and then its main results.

Poster prize

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