

## Latest results on T2K Near Detector constraints for neutrino oscillation measurements

*Thursday, 4 August 2022 11:56 (18 minutes)*

T2K is a long baseline neutrino experiment which exploits a neutrino and antineutrino beam at JPARC to perform precision measurements of atmospheric parameters  $\Delta m_{32}^2$ ,  $\sin^2(\theta_{23})$  and to provide  $3\sigma$  exclusion for some intervals of the CP-violating phase  $\delta_{CP}$ .

The latest results of the measurement of oscillation parameters will be presented, the main systematic uncertainties limiting the precision will be described, as well as the role of the near detector to constrain such systematic uncertainties. In particular, the latest analysis exploits a new nuclear model to describe neutrino-nucleus interactions, a new flux tuning based on an improved NA61/SHINE hadro-production measurement and new samples with proton and photon tagging at the near detector. All these novelties, designed to extract more robust constraints on the mentioned systematics uncertainties, will be described, together with the results of such improved analysis at the near detector. The future strategy to improve further the precision will be presented: the T2K beam will be upgraded with increased power and an upgrade of the ND280 near detector, located 2.5 degrees off-axis, is being assembled to exploit the increased statistics.

### Attendance type

In-person presentation

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**Session Classification:** Joint Session

**Track Classification:** WG1: Neutrino Oscillation Physics