ID de la contribución : **1047** Tipo : **Talk**

From Commissioning to Performance: The New High-Angle TPCs in the T2K Near Detector Upgrade

miércoles, 19 de noviembre de 2025 15:00 (15)

The T2K experiment in Japan is a long-baseline neutrino oscillation experiment searching for CP violation in the leptonic sector. To enhance the precision of its measurements, the near detector ND280 has recently been upgraded with two new High-Angle Time Projection Chambers (HA-TPCs). The HA-TPCs improve the tracking of particles from neutrino interactions at high angles.

The HA-TPCs combine two key innovations: a lightweight composite field cage that maximises the active volume while reducing the material budget and Encapsulated Resistive Anode Micromegas (ERAMs), a novel readout technology providing stability and robustness without sacrificing spatial resolution. All detectors in the upgrade project were installed at J-PARC between autumn 2023 and spring 2024. The detectors were successfully commissioned with cosmic rays and the neutrino beam and, since June 2024, have been taking data as the fully upgraded ND280.

First performance studies show that the HA-TPCs are meeting the design goals, with promising results in spatial, momentum, and energy resolution. Dedicated analyses of spatial resolution in the drift direction, along with studies of electric-field behaviour, further confirm their performance for long-term operation. These achievements mark a key milestone for T2K and confirm the robustness of HA-TPCs for long-term operation for next-generation neutrino experiments such as Hyper-Kamiokande.

Abstract

Primary author(s) : VARGHESE, Merlin (IFAE, BARCELONA)

Presenter(s) : VARGHESE, Merlin (IFAE, BARCELONA)

Clasificación de la sesión : RENATA (Red Nacional Temática de Astropartículas)

Clasificación de temáticas : Red Temática de Astropartículas (RENATA)