

# Commissioning of High Angle Time Projection Chambers for T2K ND Upgrade

*martedì 18 giugno 2024 17:30 (2 ore)*

T2K (Tokai to Kamioka) is a long baseline neutrino experiment located in Japan\cite{t2k}. Over the last few years, the experiment has been focused on the study of the  $\delta_{CP}$  phase parameter of the PMNS matrix, which may introduce a Charge-Parity violation component in the Leptonic Sector. \\\

T2K has entered its Second Phase, characterized by upgrades of the Beam Line and of the Near Detector. The new Near Detector design includes the installation of a new target and tracking system, including two High Angle Time Projection Chambers devoted to the identification of charged particles at large angles with respect to beam direction\cite{t2kup}.\\\

HA-TPCs are based on a gaseous active volume contained in a Field Cage made of lightweight composite material, combining optimal mechanical and electrical properties with minimal radiation length and dead volume. The readout is performed by innovative Resistive Micromegas modules featuring a resistive layer for charge spreading on top of the readout plane to enhance spatial resolution performances. The mentioned technologies have been tested during several test beams and cosmic rays campaigns\cite{cern2018}\cite{desy2019}\cite{cern2022}\cite{eram2023}. After the installation at J-Parc in Fall 2023, a commissioning period of data taking with cosmics and then with a neutrino beam has been performed.

This poster focuses on the characterization and commissioning performances of the HA-TPCs at CERN and J-Parc, including also the first results using beam neutrinos interactions.

\begin{thebibliography}{999}

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Attié, D.; et al. Performances of a resistive Micromegas module for the Time Projection Chambers of the T2K Near Detector upgrade. {\em Nucl. Instrum. Meth. A} {\bf 2020}, {\em 957}, 163286.

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Attié, D.; et al. Characterization of resistive Micromegas detectors for the upgrade of the T2K Near Detector Time Projection Chambers. {\em Nucl. Instrum. Meth. A} {\bf 2022}, {\em 1025}, 166109.

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\bibitem[6]{eram2023}

Ambrosi, L.; et al. Characterization of charge spreading and gain of encapsulated resistive Micromegas detectors for the upgrade of the T2K Near Detector Time Projection Chambers.{\em Nucl. Instrum. Meth. A} {\bf 2023} {\em 1056}, 168534.

\end{thebibliography}

## Poster prize

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T2K

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**Classifica Sessioni:** Poster session and reception 1

**Classificazione della track:** Accelerator neutrinos