

The T2K TPCs

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The Tokai-to-Kamiokande (T2K) experiment is a second generation long baseline neutrino oscillation experiment which will start taking data at the end of 2009. A high intensity muon neutrino beam produced at the new JPARC proton accelerator complex at Tokai, Japan is aimed at the Super-Kamiokande detector which is 295 km away. The goals of the experiment include the precision measurement of the muon neutrino disappearance parameters θ_{23} and Δm_{23}^2 and the determination of θ_{13} by the measurement of the muon neutrino to electron neutrino appearance signal.

A near detector complex (ND280) located 280 m from the target will be used to measure the neutrino energy spectrum, flavour content and interaction rates of the unoscillated beam. The tracking part of ND280 consists of two finely segmented scintillator modules (FGDs) and three large gaseous Time Projection Chambers (TPCs) operated within a 0.2 T magnetic field provided by the ex UA1/Nomad magnet.

The TPCs are designed to measure the charge, the momentum, and the identity of charged particles through ionization loss in the gas. 72 micromegas modules, with an equivalent surface of 9 m^2 will equip the three TPCs.

The first TPC has already been constructed and tested with a particle beam and cosmic ray muons. The TPCs will be installed at JPARC in 2009.

The design and construction aspects, the present construction status and results from a beam test operated at TRIUMF with the first fully equipped TPC will be presented.

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