

Measurement of T2K Anti-neutrino Beam Properties Using the INGRID On-axis Near Detector

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In the T2K experiment, neutrino oscillations are measured by using the J-PARC neutrino beam, the near detector in J-PARC and the far detector, Super-Kamiokande, at Kamioka. The T2K experiment uses an almost pure muon neutrino beam and measures neutrino oscillation parameters. T2K made the first observation of electron neutrino appearance in a muon neutrino beam and constrained CP violating phase $\delta_{CP}^{[1]}$. T2K will have anti-neutrino beam to enhance the sensitivity to CP violation measurement $\sin \delta \neq 0$ in 2014. This is the first anti-neutrino beam operation for T2K, so, it is important to measure the beam properties using the near detector.

INGRID on-axis near detector consists of 14 + 2 identical modules. We use only 14 modules arranged in horizontal and vertical arrays around beam center to measurement of beam properties. Neutrino beam profile center and intensity are measured using the number of observed neutrino events in each module.

We will report anti-neutrino beam measurements using the INGRID based on the anti-neutrino run by the summer of 2014.

Reference

[1] K. Abe et al. (T2K Collaboration), PhysRevLett.112.061802 (2014)

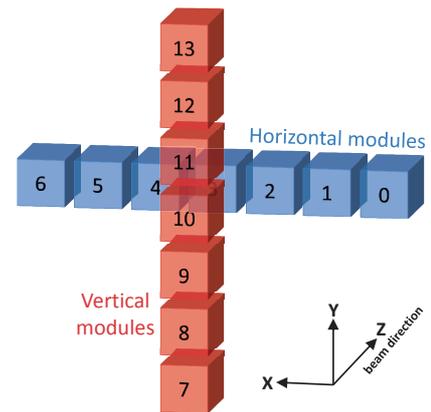


Fig. 1 INGRID on-axis near detector consists of 14 + 2 identical modules. +2 modules aren't described.

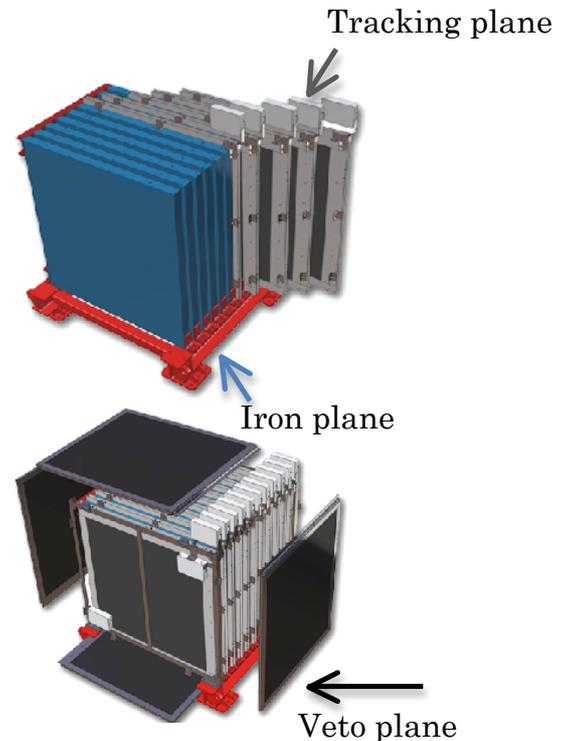


Fig. 2 An INGRID module