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SUMMARY OF THE LATEST RESULTS AND FUTURE PROSPECTS FROM THE T2K EXPERIMENT

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The T2K long-baseline experiment is located in Japan and is designed to study oscillations of muon neutrinos. T2K receives a beam of muon neutrinos peaked at 0.6 GeV that are produced at J-PARC accelerator complex by converting a beam of 30-GeV protons hitting a graphite target. Upon travelling 295 km, neutrinos are detected by the Super-Kamiokande water Cherenkov detector. Located at 280 m from the target, the near detector complex (ND280) provides information about un-oscillated neutrino flux, direction and interaction cross-sections. The T2K experiment observed electron neutrino appearance at Super-K with the significance of 7.3σ and measured the associated oscillation parameter θ_{13} for both normal and inverted mass hierarchies. In addition, by looking at muon neutrino disappearance T2K provided improved measurements of the θ_{23} and Δm_{21}^2 parameters. The results of these measurements are presented as well as a brief summary of the neutrino cross section measurements. Future prospects of the T2K experiment are discussed.

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