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Current status of neutrino oscillation physics with neutrinos from accelerators

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In the last years, experiments with neutrinos from accelerators have been instrumental for our knowledge of neutrino oscillations.

Long baseline neutrino experiments (T2K and NOVA), combining a high-intensity neutrino beam, sophisticated near detectors and massive far detectors, have established a non zero θ_{13} angle and measured with precision the θ_{23} angle and the Δm^2_{32} mass difference.

After a description of the experimental setup, recent results from these long baseline experiments will be showed with emphasis on the T2K experiment.

T2K decided to launch a major upgrade of its near detector that has been recently installed, featuring a novel highly segmented Fine Grained Detector and two new TPCs. Moreover, the accelerator complex has been upgraded to reach a proton beam power on target of 800 kW.

I will briefly mention the future of the field : new experiments (DUNE and HyperKamiokande) are in construction to complete the picture with measurements of the CP violation phase δ and the mass ordering.

The challenges facing this program will be presented, in particular the uncertainties in the neutrino nucleus cross-sections.

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