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Joint fit of long-baseline accelerator neutrino experiments in GNA software.

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Long-baseline accelerator neutrino experiments are researching a phenomenon of neutrino oscillations. They are studying unknown mixing parameters such as δ_{CP} (the charge-parity phase), Δm^2_{32} (the neutrino mass ordering) and the octant of mixing angle θ_{23} using samples of muon neutrino disappearance and electron neutrino appearance.

At the moment the sensitivities of each single existing experiment (NOvA, T2K) are not enough to determine mentioned above oscillation parameters with high significance. So the next generation accelerator neutrino experiment DUNE is under construction and has some advantages, i.e the longest baseline, a more intensive neutrino flux, a 40 kt FD fiducial mass and so on.

In order to estimate the sensitivities (single and joint) of NOvA, T2K, and DUNE, a universal shell is developed in GNA (Global Neutrino Analysis) software. It is able to check different oscillation statistical hypotheses and produce plots of sensitivities to oscillation parameters for an experiment of this type based on input files of fluxes, neutrino interaction cross sections and detector efficiencies. And a combination of experiment models is used to create a joint fit of these experiments.

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