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Future Neutrino Oscillation Facilities

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An outline of the present and future long-baseline neutrino facilities with emphasis on the possibilities at CERN is presented. Accelerator-made neutrinos for long baseline oscillation experiments open the exploration to a broad and rather interesting field of physics experiments, with the measurement of the neutrino mixing angle (θ13), the determination of the sign of neutrino mass hierarchy (Δm232) and the search for CP violation in neutrino sector as an ultimate goal. CERN presently operates the CNGS neutrino beam servicing the OPERA and ICARUS experiments at Grand Sasso aiming at the discovery of νμ to ντ oscillation appearance. Options for future facilities include high-intensity muon neutrino beams from pion decay (Super-Beams), electron neutrino beams from nuclei decays (Beta Beam'), or muon and electron neutrino beams from muon decay (Neutrino Factory'), each associated with one or several options for detector systems. Synergetic possibilities between the proposed facilities and the technical challenges for the accelerators will be discussed.

Auteur principal: EFTHYMIOPOULOS, Ilias (CERN)

Orateur: EFTHYMIOPOULOS, Ilias (CERN)

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