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<https://us02web.zoom.us/j/83700792469>

Precision measurements in the DUNE Near Detector Complex

Abstract: The experimental confirmation of the oscillation of neutrino flavors in the last 2 decades has been a milestone in clarifying the framework of particle physics. Some of neutrino properties can be explained through the current rich data of the neutrino experiments; however, there are still important unanswered questions which need to be clarified. Next-generation, long-baseline neutrino oscillation experiments are under serious consideration to answer these questions. The unprecedented neutrino fluxes at these experiments make them suitable for precision calculations of the SM predictions as well as searching for light new physics (NP) via measurements of the trident production and neutrino scattering off electrons and nuclei in the near detectors. We provide estimates of the number and distribution of neutrino-electron scattering and trident events at the DUNE near detector, and use them to study the weak angle. We then use these neutrino scatterings to probe leptophilic light  $Z'$  models. Finally, we quantify the DUNE sensitivity to dimension-6 operators in the SMEFT parameters.

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<https://arxiv.org/abs/1912.06658>

<https://arxiv.org/abs/1902.08579>

<https://arxiv.org/abs/1807.10973>

<https://arxiv.org/abs/1802.08296>