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Optimization of the SAND Near Detector Configuration for the DUNE Experiment

Monday 12 December 2022 14:00 (1 hour)

DUNE (Deep Underground Neutrino Experiment) is a long baseline neutrino oscillation experiment that is currently being built to study the $\nu_\mu - \nu_e$ oscillations, which will eventually help in determining the neutrino mass-hierarchy, CP violation in the lepton sector and many other exciting areas of particle physics. A Near Detector (ND) Complex comprising three detectors - ND-GAr, ND-LAr, SAND, is proposed to be built 575 m from the neutrino source to monitor unoscillated ν_μ . The oscillated ν_e will be detected at the far detector 1300 km from the neutrino source in a 70 kton Liquid-Argon volume. It is important to measure the neutrino beam flux at the source precisely in order to reduce uncertainties on the ν_e to ν_μ ratio measurements at the FD.

SAND (System for on-Axis Neutrino Detection) is one of the key detectors at DUNE to monitor the neutrino beam. It consists mainly of low-density Straw Tube Trackers (STTs), and a Liquid Argon volume (GRAIN) to obtain the necessary precision in neutrino flux measurements. The simulation studies performed to optimize the geometry, for reducing flux uncertainties, will be presented at the symposium.

Session

Future Experiments and Detector Development

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