

# Decipher the Quantum Behavior of Neutrinos with DUNE PRISM

*Friday 19 July 2024 16:45 (15 minutes)*

Our understanding of neutrinos faces limitations from neutrino-nucleus interaction uncertainties. Constraining the uncertainties has proven challenging given the absence of a complete model. To bypass most uncertainties, a DUNE physics program named PRISM employs a data-driven approach to measure neutrino oscillations. It involves the near detector (ND) moving off the neutrino beam axis to sample various neutrino energy spectra which are then linearly combined to predict the far detector oscillated spectrum. However, interaction uncertainties still affect the oscillation sensitivity primarily through the Monte Carlo based ND efficiency correction where interaction systematics introduce large variations in the predicted spectrum. We have developed a new data-driven geometric efficiency correction technique that further eliminates the interaction model dependence. In this talk, I will present this data-driven technique and its demonstrated performance using on-axis ND and FD data.

## Alternate track

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Yes

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