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Prospects for anomalous tau neutrino appearance searches at the DUNE Near Detector[1] MIRIAMA RAJAOALISOA[2], University Of Cincinnati, DEEP UNDERGROUND NEUTRINO EXPERIMENT (DUNE) COLLABORATION — The DUNE experiment will use the new LBNF neutrino beam sampled at the Near Detector complex (DUNE ND), 574 m downstream of the production target, and at the Far detector, 1300 km away at the SURF laboratory. The multi-detector DUNE ND, with a LAr TPC (Liquid Argon Time Projection Chamber) as its primary detector, enables DUNE to probe for new physics beyond the Standard Model, such as short-baseline tau neutrino appearance mediated by sterile neutrino oscillations. Due to the high energy production threshold of the tau lepton and its very short lifetime, detection of tau neutrinos is very challenging, but the large statistics expected (especially in high-energy configuration) for the LBNF beam, as well as the excellent spatial resolution of the DUNE ND detectors, present an opportunity to search for this unique signature. This study is focused on charged-current tau neutrino interactions, identified using multivariate methods based on kinematic variables. In this talk, I will review the tau neutrino selection strategy for the DUNE ND, and present DUNE's expected sensitivities to short-baseline tau neutrino appearance, assuming mixing between active and sterile neutrinos.

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