

Phenomenology 2025 Symposium



Contribution ID: 99

Type: **not specified**

Tau Tridents at Accelerator Neutrino Facilities

Monday 19 May 2025 17:45 (15 minutes)

We present the first detailed study of Standard Model neutrino tridents involving tau leptons at the near detectors of accelerator neutrino facilities. These processes were previously thought to be negligible, even at future facilities like DUNE. However, our full $2 \rightarrow 4$ calculation, including both coherent and incoherent scatterings, reveals that

the DUNE near detector will actually get a non-negligible number of tau tridents, which is an important background to new physics searches. We identify promising kinematic features that may allow distinction of tau tridents from the usual neutrino charged-current background at DUNE, and thus could establish the observation of tau tridents for the first time. We also comment on the detection prospects at other accelerator and collider neutrino experiments.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

Author: LOPEZ GUTIERREZ, Diego (Washington University in St Louis)

Co-authors: DEV, Bhupal (Washington University in St. Louis); Dr BIGARAN, Innes (Fermilab and Northwestern University); MACHADO, Pedro (Fermilab)

Presenter: LOPEZ GUTIERREZ, Diego (Washington University in St Louis)

Session Classification: Neutrino

Track Classification: Neutrino Physics