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# Enhancing Neutrino Flavour Sensitivity in TRIDENT with Tau Neutrino Identification

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The detection of the flavor ratio of astrophysical neutrinos provides valuable insight into the neutrino production mechanisms within astrophysical sources and serves as a powerful probe for new physics. Building on the exciting observation of seven tau neutrino candidates by the IceCube experiment in 2024, the TRopIcal DEep-sea Neutrino Telescope (TRIDENT), as a next-generation neutrino telescope, aims to enhance all-flavor neutrino detection, with a particular focus on improving sensitivity to tau neutrinos. This expects to be achieved through the recording of multi-channel waveforms from each PMT within the Hybrid Digital Optical Modules as well as leveraging the reduced scattering optical properties of seawater. In this talk, we present preliminary results for the expected tau neutrino identification efficiency in TRIDENT and demonstrate its ability to determine the neutrino flavor ratio of the diffuse astrophysical flux.

## Collaboration(s)

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