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## Constraining NSI and Sterile Neutrino Physics with $\nu_\tau$ Appearance in DUNE

We consider the  $\nu_\mu \rightarrow \nu_\tau$  appearance channel in the future Deep Underground Neutrino Experiment (DUNE) which offers a good statistics of the  $\nu_\tau$  sample. In order to measure its impact on constraining the oscillation parameters, we consider several assumptions on the efficiency for  $\nu_\tau$  charged-current signal events (with subsequent  $\tau \rightarrow e$  decay) and the related backgrounds and study the effects of various systematic uncertainties. Two different neutrino

fluxes have been considered, namely a CP-violation optimized flux and a  $\nu_\tau$  optimized flux.

Our results show that the addition of the  $\nu_\mu \rightarrow \nu_\tau$  appearance channel does not reduce the current uncertainties on the standard 3- $\nu$  oscillation parameters while it can improve in a significant way the sensitivity to the Non-Standard Interaction parameter  $|\epsilon_{\mu\tau}|$  and to the new mixing angle  $\theta_{34}$  of a sterile neutrino model of the 3 + 1 type.

### Collaboration name

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