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## Evolution of Neutrino Mass-Mixing Parameters in Matter with Non-Standard Interactions

We explore the role of matter effect in the evolution of neutrino oscillation parameters in the presence of non-standard interactions (NSI) of neutrino. We derive approximate analytical expressions for the modified mass-mixing parameters in matter with NSI. We observe that only the NSI parameters in the (2,3) block, namely  $\varepsilon_{\mu\tau}$  and  $(\gamma - \beta) \equiv (\varepsilon_{\tau\tau} - \varepsilon_{\mu\mu})$  affect the running of  $\theta_{23}$ . Though all the NSI parameters influence the evolution of  $\theta_{13}$ ,  $\varepsilon_{e\mu}$  and  $\varepsilon_{e\tau}$  show a stronger impact at the energies relevant for DUNE. The solar mixing angle  $\theta_{12}$  quickly approaches to  $\sim 90^\circ$  with increasing energy in both SI and SI+NSI cases. The change in  $\Delta m_{21,m}^2$  is quite significant as compared to  $\Delta m_{31,m}^2$  both in SI and SI+NSI frameworks for the energies relevant for the DUNE baseline. Flipping the signs of the NSI parameters alters the way in which mass-mixing parameters run with energy. We demonstrate the utility of our approach in addressing several important features related to neutrino oscillation such as a) unraveling interesting degeneracies between  $\theta_{23}$  and NSI parameters, b) estimating the resonance energy in presence of NSI when  $\theta_{13}$  in matter becomes maximal, c) figuring out the baseline length and neutrino energies required to have maximum  $\nu_\mu \rightarrow \nu_e$  transition in the presence NSI. d) study the impact of NSI in  $\nu_\mu \rightarrow \nu_\mu$  disappearance channel.

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