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

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We explore the role of matter effect in the evolution of neutrino oscillation parameters in the presence of non-standard interactions (NSIs). We derive approximate analytical expressions showing evolution of mass-mixing parameters in matter and in presence of NSIs. We observe that only the NSIs in (2,3) block ( $\varepsilon_{\mu\mu}$ ,  $\varepsilon_{\tau\tau}$ , and  $\varepsilon_{\mu\tau}$ ) affect the running of  $\theta_{23}$ .  $\varepsilon_{e\mu}$  and  $\varepsilon_{e\tau}$  have stronger impact on the  $\theta_{13}$  evolution. We show the utility of our approach in addressing some important features related to neutrino oscillation: a) unraveling interesting degeneracies between  $\theta_{23}$  and NSI parameters, b) estimating the resonance energy in presence of NSIs when  $\theta_{13}$  in matter becomes maximal, c) estimating the required baseline length and neutrino energies to have maximal matter effect in  $\nu_{\mu} \rightarrow \nu_e$  transition in presence of NSI parameters, and d) studying the impact of NSIs in (2,3) block on the  $\nu_{\mu} \rightarrow \nu_{\mu}$  survival probability.

### Collaboration name

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