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Evolution of Neutrino Mass-Mixing Parameters in Matter with Non-Standard Interactions SUDIPTA DAS, PRAGYANPRASU SWAIN, MEHEDI MASUD, SANJIB KUMAR AGARWALLA, Institute of Physics, Bhubaneswar — We explore the role of matter effect in the evolution of neutrino oscillation parameters in the presence of flavor-conserving and flavor-violating non-standard interactions (NSIs) of the neutrino. We derive simple approximate analytical expressions showing the evolution/running of the mass-mixing parameters in matter with energy 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 θ_{23}. Though all the NSIs influence the evolution of θ_{13}, $\varepsilon_{e\mu}$ and $\varepsilon_{e\tau}$ show a stronger impact. θ_{12}^m saturates to $\pi/2$ at smaller energy. We demonstrate the utility of our approach in addressing several important features related to neutrino oscillation such as: a) unraveling interesting degeneracies between θ_{23} and NSI parameters, b) estimating the resonance energy in presence of NSIs when θ_{13} in matter becomes maximal, c) figuring out the required baseline length and neutrino energies to have maximal matter effect in $\nu_\mu \to \nu_e$ transition with NSIs, and d) studying the impact of NSIs in (2,3) block on the ν_μ survival probability.

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