XIX International Workshop on Neutrino Telescopes



Contribution ID: 214

Type: Parallel Flash talk

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

Tuesday, 23 February 2021 12:05 (5 minutes)

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 massmixing 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 θ_{23} . $\varepsilon_{e\mu}$ and $\varepsilon_{e\tau}$ have stronger impact on the θ_{13} evolution. We show the utility of our approach in addressing some important features related to neutrino oscillation: 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) 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

Primary author: DAS, Sudipta (Institute of Physics, Bhubaneswar)

Co-authors: Mr AGARWALLA, Sanjib (Institute of Physics, Bhubaneswar); Mr SWAIN, Pragyaprasu (Institute of Physics, Bhubaneswar); Dr MASUD, Mehedi (IBS Daejeon South Korea)

Presenter: DAS, Sudipta (Institute of Physics, Bhubaneswar)

Session Classification: Non Standard Interactions

Track Classification: Neutrino Theory and Cosmology