



Contribution ID: 200

Type: Poster

Decoherence effect on neutrino oscillation probabilities

Monday, January 10, 2022 4:15 PM (1 minute)

Neutrinos propagating through matter behaves like an open-quantum system. These neutrinos interact with the environment via weak coupling. It leads to a loss of coherence of the neutrino mass states. We generally observe this phenomenon of decoherence in systems interacting with a dissipative environment. In this present work, we are exploring how environmental decoherence affects neutrino survival and appearance probabilities. Considering neutrinos as an open-quantum system, we apply the Lindblad Master equation to study the evolution of the neutrino states. Moreover, we also incorporate the matter effects using the Cayley-Hamilton formalism.

We are working on a general algorithm that will give out the neutrino oscillation probabilities by solving the Lindblad Master equation taking into account the environmental decoherence. We'll present our work on understanding the potential effect of induced decoherence on the oscillation probabilities for the long baseline sector.

Primary authors: Mr SARKER, Arnab (Tezpur University, Assam, India); Dr DEVI, Moon Moon (Tezpur University, Assam, India)

Presenter: Mr SARKER, Arnab (Tezpur University, Assam, India)

Session Classification: Neutrino physics

Track Classification: Neutrinos