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Study of sterile neutrino mixing in low energy neutrino factory

A neutrino factory has been suggested as a powerful tool for studying new physics, for example, sterile neutrinos, exploiting its near detectors.

Here we study the potential of a low energy neutrino factory (LENF) in constraining the sterile mixing angles and the mass-square difference. Unlike in conventional long baseline neutrino experiments, the electron neutrino appearance and disappearance channels are also included, since they are proved helpful in constraining sterile mixing angles.

Moreover, the recent re-analysis of reactor neutrino experiments suggests the presence of neutrino oscillations due to large sterile neutrino mixing with electron neutrino. We show that, with a near detector, LENF can constrain the sterile parameter values in a very small range and helps us to check the recent Reactor Anomaly.

Finally, we will explore the dependence of the performance of the LENF depending on different experimental setups.

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