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NSI effects in next-generation neutrino experiments

Non-standard interactions (NSI) of neutrinos in matter have long been proposed as a way to quantify new physics in the neutrino sector beyond mass generation. Including these effects in the oscillation framework can lead to large differences in the interpretation of experimental data with respect to Standard Model (SM) weak interactions alone, causing degeneracies in measurements of the solar mixing angle, the CP-violating phase δ , and the mass hierarchy, among others. By comparing the sensitivities of different experimental setups from current and future neutrino experiments, with a focus on measurements of solar and reactor neutrino oscillation parameters, it may be possible to establish whether these degeneracies can be resolved by the next generation of neutrino experiments, namely JUNO and Hyper-Kamiokande.

Mini-abstract

Can the next generation of neutrino experiments resolve degeneracies caused by NSI in matter?

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