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Probing Non-Unitary Neutrino Mixing at INO-ICAL

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The mixing among three light active neutrinos is parametrized using the unitary PMNS matrix. If there are additional neutrinos present in Nature which are heavy iso-singlets, then the effective mixing matrix for the light three active neutrinos would be non-unitary. Because of this non-unitary neutrino mixing (NUNM), the oscillation probabilities between the three active neutrinos would be altered as compared to the probabilities obtained under the assumption of a unitary PMNS matrix. Atmospheric neutrinos have access to a wide range of energies and baselines, which can feel the presence of such NUNM in Earth's matter effect. In this talk, I will discuss the possible constraints that can be placed on the NUNM parameter (α_{32}) in a model-independent fashion using the proposed 50 kt magnetized Iron Calorimeter (ICAL) detector under the India-based Neutrino Observatory (INO) project, which can efficiently detect the atmospheric ν_μ and $\bar{\nu}_\mu$ separately in the multi-GeV energy range passing through deep inside the Earth.

Session

Neutrino Physics

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