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Earlier Resolution of Neutrino Mass Ordering?

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In our arXiv:2008.11280 (under publication), we demonstrate that the combined sensitivity of JUNO with NOvA and T2K experiments has the potential to become the first fully resolved ($\geq 5\sigma$) measurement of neutrino Mass Ordering (MO) tightly linked to the JUNO schedule. In the absence of any concrete MO theoretical prediction and given its intrinsic binary MO outcome, we thus highlight the benefits of having such a resolved measurement in the light of the remarkable MO resolution ability of the next generation of long baseline neutrino beams experiments, such as DUNE. We also motivate the opportunity of exploiting this MO experimental framework to scrutinise the standard oscillation model, thus, opening for unique discovery potential, should unexpected discrepancies manifest. Phenomenologically, the deepest insight relies on the articulation of MO resolved measurements via at least the two possible methodologies matter effects and purely vacuum oscillations. We argue and explain how the JUNO vacuum MO measurement may feasibly yield full resolution in combination to the next generation of long baseline neutrino beams experiments.

Collaboration name

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