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Neutrino mass ordering determination through combined analysis with JUNO and KM3NeT/ORCA

The determination of neutrino mass ordering (NMO) is one of the prime goals of several neutrino experiments. KM3NeT/ORCA and JUNO are two next-generation neutrino oscillation experiments both aiming at addressing this question. ORCA can determine the NMO by probing Earth matter effects on the oscillation of atmospheric neutrinos in the GeV energy range. JUNO, on the other hand, is sensitive to the NMO by investigating the interference effects of fast oscillations in the reactor electron antineutrino spectrum at medium baseline. This talk presents the potential of determining the NMO through a combined analysis of JUNO and ORCA data. When measuring the Δm^2_{31} with a wrong ordering assumption, the best-fit values are different between the two experiments. This tension, together with good constraints on the Δm^2_{31} measurement by both experiments, enhances the combined NMO sensitivity beyond the simple sum of their sensitivities. The analysis shows that 5σ significance is reachable in less than 2 years of data taking with both experiments for true normal neutrino mass ordering assuming current global best-fit values of the oscillation parameters, while 6 years will be needed for any other parameter set.

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