

Results from Testing the Neutrino Mass Ordering with Three Years of IceCube DeepCore Data

The measurement of the Neutrino Mass Ordering (NMO), i.e. the ordering of the three neutrino mass eigenstates, is a major goal of many future experiments. One strategy to measure the NMO is observing matter effects in the oscillation pattern of atmospheric neutrinos as proposed for the Precision Next Generation Upgrade (PINGU) of the IceCube Neutrino Observatory.

This type of measurement can already be explored with the currently running IceCube DeepCore detector. Albeit with lower significance, such a measurement contributes to the current understanding. Moreover, it exercises the measurement principle and thus prototypes future analyses with PINGU.

We present results from two independent likelihood analyses measuring the NMO with three years of data from IceCube DeepCore. In the more sensitive one, we observe a slight preference for Normal Ordering in the first octant, close to maximum-mixing, with a p-value of $p_{\text{IO}} = 15.3\%$ ($\text{CL}_s = 53\%$) for Inverted Ordering.

Authorship annotation

for the IceCube Collaboration

Session and Location

Wednesday Session, Poster Wall #183 (Ballroom)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)