

Impact of the HF-CRPA Model on Neutrino Oscillation Parameter Measurements in NOvA

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The NOvA experiment, a long-baseline neutrino experiment based at Fermilab, is dedicated to measuring various neutrino oscillation parameters with high precision. One of the significant contributions to systematic uncertainty in these measurements is the cross-section systematics, which arises from an incomplete understanding of nuclear models and neutrino-nucleus interactions. Recently, there has been growing interest in the Hartree Fock Continuum Random Phase Approximation (HF-CRPA) model for quasi-elastic interaction processes. This HF-CRPA model offers substantial improvements in the low-momentum-transfer region, with an approximate 10% enhancement in cross-section.

In this talk, I will present our study on the impact of the HF-CRPA model on the latest measurements of the three PMNS matrix parameters: Δm_{32}^2 , $\sin^2(\theta_{23})$, and δ_{CP} .

Working Group

WG 1: Neutrino Oscillation Physics

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