

Anticipation of the discovery potential sensitivity of next-generation neutrinoless double beta decay experiments

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The upcoming wave of neutrinoless double beta decay ($0\nu\beta\beta$) experiments is geared towards probing the inverted mass ordering and transitioning into the normal ordering domains. We undertake a quantitative assessment of the projected experimental sensitivities, with a specific emphasis on the discovery potentials anticipated prior to the execution of experiments. We assess the sensitivity of the counting analysis using full Poisson statistics [1] and compared with its continuous approximation. The inclusion of additional measurable signatures such as energy can enhance sensitivity, and this is accounted for through a maximum likelihood analysis [2]. This study serves as an example to the generic problem of making sensitivity projections to proposed projects with predicted background prior to the experiments are performed.

References

- [1] M. K. Singh et al., Phys. Rev. D 101, 013006 (2020).
- [2] M. K. Singh et al., Phys. Rev. D 109, 032001 (2024).

Alternate track

1. Beyond the Standard Model

I read the instructions above

Yes

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