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Status and Future of Neutrinoless Double-Beta Decay Nuclear Matrix Elements

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Neutrinoless double-beta decay is a lepton-number violating process that will establish that neutrinos are its own antiparticle. In the next few years, ton-scale experiments will aim for the detection of this rare decay. Naturally, the nuclear decay rate depends on the nuclear matrix element of the transition (NME). The NMEs are necessary to constrain the neutrino mass from limits on the decay lifetime, and also, once neutrinoless double-beta decay has been observed, to obtain a value for the absolute neutrino mass.

For these purposes, reliable NME calculations are crucial. I will review he status of nuclear structure calculations for neutrinoless double-beta decay NMEs highlighting recent progress in the field. I will discuss some key issues that need to be addressed in order to meet the demand for accurate NMEs, including improvements in the nuclear structure calculations and in the treatment of the double-beta decay operator.

Summary

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