

Calculation of nuclear matrix elements in neutrinoless double electron capture matrix elements with energy density functional methods

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The nature of the neutrino as a Majorana or Dirac particle is still an open question. Experimental evidence of lepton-number violation weak processes such as neutrinoless double beta decay ($0\nu\beta\beta$) or double electron capture ($0\nu\text{ECEC}$) would determine unambiguously the Majorana character of this elementary particle. In this contribution we apply state-of-the-art beyond self-consistent mean field methods to compute the nuclear matrix elements (NME) of such processes. Generating coordinate method with particle number and angular momentum projection with the Gogny D1S/D1M forces is used. We analyze explicitly the role of the deformation and pairing in the evaluation of the NMEs (see Refs. [1]-[2] and references therein for further details).

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- [1] T. R. Rodríguez and G. Martínez-Pinedo, Phys. Rev. Lett. **105**, 252503 (2010).
[2] T. R. Rodríguez and G. Martínez-Pinedo, Phys. Rev. C **85**, 044310 (2012).