

Nuclear Theory

Jastrow functions in double-beta decay

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We use simple analytic considerations and a Monte Carlo calculation of nucleons in a box to argue that the use of Jastrow functions as short-range correlators in the commonly employed two-body-cluster approximation causes significant errors in the matrix elements for double-beta decay. The Jastrow approach appears to agree with others, however, if many-body clusters are included. A careful treatment of the charge-changing analog of the nuclear pair density shows, in addition, that differences between Unitary Correlator Operator Method and Brueckner methods for treating short-range correlations in double-beta are less significant than suggested by previous work.

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