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Vertex correction to nuclear matrix elements of double-β decays

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The predicted neutrinoless double-β (0νββ) decay is the crucial phenomenon to prove the existence of the Majorana neutrino, which gives a foundation to the Fukugita-Yanagida theory explaining the matter prevalence of the universe. The nuclear matrix element (NME) of 0νββ decay is an important theoretical quantity for the detector design for the next generation of the 0νββ decay search. Reliable calculation of this NME is a long-standing problem because of the diversity of the predicted values of the NME. A particular difficulty comes from the fact that the effective strength of the Gamow-Teller transition operator for this decay is not established. I will discuss what vertex corrections are necessary for the 0νββ NME by the hybrid model of application of the quantum field theory to the leptons and the Rayleigh-Schrödinger perturbation to the nucleons. In the first order, the two-body nucleon current and the exchange vertex corrections are important.

Alternate track

I read the instructions above

Yes

Author: TERASAKI, Jun

Presenter: TERASAKI, Jun

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