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## CFA LECTURES

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# Short-range correlation effects on the nuclear matrix element of neutrinoless double-beta decay

*- Abstract -*

I will report the results of a calculation of the nuclear matrix element of neutrinoless double-beta decay of  $^{48}\text{Ca}$ , carried out taking into account nucleon-nucleon correlations in both coordinate- and spin-space. The inclusion of spin-spin correlations, which are known to play an important role in determining the short distance structure of nuclei, leads to a mixing of the Fermi and Gamow-Teller amplitudes. The numerical results, obtained using nuclear matter correlation functions, suggest that inclusion of correlations may lead to a decrease of the matrix element, with respect to the shell model prediction, as large as 20%. This conclusion is supported by the results of an independent calculation, in which correlation effects are taken into account using the spectroscopic factors of  $^{48}\text{Ca}$ , obtained from a *ab initio* many body approach, to renormalize the shell model states.

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