Nuclear matrix element of Super-allowed Fermi transitions: Preliminary results in the HTDA framework

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Super-allowed Fermi transitions $0^+ \rightarrow 0^+$ are 'as well known', useful tools for testing the CVC hypothesis and the unitarity of the CKM matrix inherant to the standard model of elementary interactions.

The isospin-symmetry breaking plays an important role for an accurate assessment of the nuclear matrix element of such transitions.

For a good description of such a symmetry breaking at a nucleonic level, it is necessary to use an approach conserving the particle numbers. This is precisely one of the specificities of the Higher Tamm-Dancoff Approximation (HTDA). In addition, the latter presents the advantage to incorporate various kinds of correlations on an equal footing and especially pairing correlations.

We shall apply the above to calculate the nuclear matrix element corresponding to e.g. ^{50}Mn $\rightarrow$ ^{50}Cr Super-allowed Fermi transition. The desciption of both inital (*odd-odd*) and final (*even-even* $N \neq Z$) nuclear states will be based on some approximations allowing us to avoid main spurious causes of isospin-symmetry breaking due to the Hartree-Fock procedure.

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