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Towards a Nuclear Parameter Calculation for Astrophysical Applications A. SAMANA, C. BARBERO, S. DUARTE, A. DIMARCO, F. KRMPOTI, Texas A&M University-Commerce — We evaluate the electronic neutrino-nucleus cross section within the context of a nuclear gross theory. We adopt an improved version of the gross theory of β-decay with a new trend for the theoretical parameter representing the energy spread of Gamow-Teller resonance by the spin-dependence part of the nuclear force within this model is obtained. A first application of this calculation is made in the region of nuclei involved in pre-supernova collapse where a comparison with available experimental results can be done ($A < 70$). The obtained results agree with previous evaluations within other microscopic models. Present formalism can be extended to the region $A > 70$ and offers an useful tool to perform nuclear calculations of neutrino capture cross section and β-decay rates for r-process nucleosynthesis within supernova neutrino wind environment.

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