

Neutrino masses, double beta-decay nuclear matrix elements and quenching of axial-vector coupling constant

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The present-day results of the calculation of the $0\nu\beta\beta$ -decay nuclear matrix elements are discussed. The progress in the calculation of the double beta decay NMES within the QRPA is presented. A connection between the $2\nu\beta\beta$ -decay and $0\nu\beta\beta$ -decay matrix elements is analyzed. An impact of the quenching of the axial-vector coupling constant on double-beta decay processes is investigated and a novel approach to determine the quenched value of axial-vector coupling constant is proposed. The question is addressed whether light and heavy neutrino contributions to $0\nu\beta\beta$ -decay are experimentally distinguishable. In that context the “interpolating formula” for the $0\nu\beta\beta$ -decay is revisited. Several simplified benchmark scenarios within left-right symmetric models are considered and the conditions for the dominance of the light or heavy neutrino mass mechanisms are analyzed

Primary author: Prof. SIMKOVIC, Fedor (Comenius University and JINR Dubna)

Presenter: Prof. SIMKOVIC, Fedor (Comenius University and JINR Dubna)

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