Selected Abstracts from Physical Review D

Abstracts of papers published in **Physical Review D** *which may be of interest to our readers are printed here.*

Supersymmetry and neutrinoless double beta decay. M. Hirsch* and H. V. Klapdor-Kleingrothaus,† *Max-Planck-Institut für Kernphysik, P.O. 10 39 80, D-69029 Heidelberg, Germany;* S. G. Kovalenko,‡ *Joint Institute for Nuclear Research, Dubna, Russia.* (Received 6 March 1995)

Neutrinoless double beta decay ($0\nu\beta\beta$) induced by superparticle exchange is investigated. Such a supersymmetric (SUSY) mechanism of $0\nu\beta\beta$ decay arises within SUSY theories with *R*-parity nonconservation (R_p). We consider the minimal supersymmetric standard model (MSSM) with explicit R_p terms in the superpotential (R_p MSSM). The decay rate for the SUSY mechanism of $0\nu\beta\beta$ decay is calculated. Numerical values for nuclear matrix elements for the experimentally most interesting isotopes are calculated within the proton-neutron quasiparticle random phase approximation. Constraints on the R_p MSSM parameter space are extracted from current experimental half-life limits. The most stringent limits are derived from data on ^{76}Ge. It is shown that these constraints are more stringent than those from other low-energy processes and are competitive with or even more stringent than constraints expected from accelerator searches. [Phys. Rev. D **53**, 1329 (1996)]

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