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Discovery possibility of new physics beyond the two-neutrinos double-beta decay

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In the past years, the increasing interest in the search for neutrinoless double beta decay ($0\nu\beta\beta$) brought the collection of an impressive amount of two-neutrinos double beta decay ($2\nu\beta\beta$) data, opening the possibility to investigate exotic $2\nu\beta\beta$ decays. In this category we include all those processes not allowed by the Standard Model (SM) and whose signal could be detected by analyzing the entire $2\nu\beta\beta$ spectral shape (e.g. the Majoron emitting decays or the violation of the Lorentz invariance in the neutrino sector). Nowadays, the data collected with the actual experiments allowed to set stringent limits on many of these beyond the SM processes. In the future, the next-generation experiments will further increase the available statistic.
Nevertheless, the unavoidable background induced by the standard $2\nu\beta\beta$ represents an intrinsic limit in the search for these processes and its fluctuations could easily mimic the new physics signal. In this contribution, we show the possibility of discovery for such processes. In particular, we show the results obtained from a numerical study performed on different isotopes, going through the relation between the expected signal strength and the experimental exposure.

Submitted on behalf of a Collaboration?

No

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