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## Neutrino properties deduced from the neutrinoless double beta decay study

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Double beta decay is a rare nuclear process of great interest due to its potential to provide information about physics beyond the Standard Model (BSM). For example, the discovery of the neutrinoless double-beta decay mode could give key information regarding conservation of symmetries: as lepton number, CP and Lorentz, or neutrino properties as: neutrinos character (are they Dirac or Majorana particles?), neutrino absolute masses and their hierarchy, existence of sterile neutrinos, etc. Theoretically, the DBD study consists in the precisely computation of the nuclear matrix elements (NME) and phase space factors (PSF) entering the DBD half-lives formulas, for different decay modes and transitions to final ground or excited states of the parent nuclei. Reliable computations of these quantities result in reliable predictions of DBD half-lives and constrains of the BSM parameters appearing in the possible mechanisms that may contribute to the neutrinoless double-betadecay.

In my talk I give first a short review of the theoretical challenges in the study of neutrinoless double-beta decay. Then I present a new, more reliable, approach to calculate the products NMEs x PSFs and I deduce new limits for the neutrino mass parameters for the light and heavy neutrino exchange scenarios.

## References

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