

# Light Sterile Neutrino Contributions to Neutrinoless Double-beta Decay

Sterile neutrinos appear in various extensions of the Standard Model and can help explain the origin of the observed active neutrino masses. Light sterile neutrinos in particular can contribute to the neutrinoless double-beta ( $0\nu\beta\beta$ ) decay amplitude, providing an additional avenue to probe new physics, in addition to the established sensitivity of the process to the Majorana nature of the neutrino, lepton-number violation, and the absolute neutrino-mass scale. In this talk, we present the first ab initio nuclear theory determination of nuclear matrix elements (NMEs) crucial in describing light sterile neutrino contributions to  $0\nu\beta\beta$  decay. In contrast to previous phenomenological calculations, we use the Valence-Space In-Medium Similarity Renormalization Group (VS-IMSRG) method, which enables rigorous quantification of theoretical uncertainties. Results are presented for key isotopes of experimental interest, alongside constraints on sterile neutrino mixing from current and next-generation experimental searches.

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