Abstract Submitted
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Sterile neutrinos and neutrinoless double beta decay in effective field theory[1] GUANGHUI ZHOU, University of Massachusetts Amherst, WOUTER DEKENS, University of California at San Diego, JORDY VRIES, University of Massachusetts Amherst, KAORI FUYUTO, EMANUELE MEREGHETTI, Los Alamos National Laboratory — I discuss neutrinoless double beta decay ($0\nu\beta\beta$) in the presence of sterile neutrinos with Majorana mass terms. The gauge-singlet fields are allowed to interact with Standard-Model (SM) fields via renormalizable Yukawa couplings as well as higher-dimensional gauge-invariant operators. I discuss how to use chiral effective field theory involving sterile neutrinos to connect the operators at the level of quarks and gluons to hadronic interactions involving pions and nucleons and how to derive an expression for $0\nu\beta\beta$ rates. The required hadronic low-energy constants and nuclear matrix elements depend on the neutrino masses, and I present interpolation formulae grounded in QCD and chiral perturbation theory. The resulting framework can be used directly to assess the impact of $0\nu\beta\beta$ experiments on scenarios with light sterile neutrinos. I demonstrate that non-standard interactions involving sterile neutrinos have a dramatic impact on $0\nu\beta\beta$ phenomenology, and next-generation
experiments can probe such interactions up to scales of O(100) TeV.

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