Abstract Submitted
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Theoretical uncertainty for neutrinoless double-beta decay from chiral EFT[1] EDUARDO COELLO PEREZ, Lawrence Livermore Natl Lab — We study how the uncertainties from chiral effective field theory (EFT) propagate to the matrix element associated to neutrinoless double-beta decay. To this end, we employ a surrogate model with nucleon droplets that mimic the dynamics of the valence nucleons in the systems of interest, and let the nucleons in them interact via chiral nucleon-nucleon and three-nucleon forces fitted to scattering data and the binding energies and radii of deuteron, triton and helium. The droplets are fitted to the energies of 0+ states in the nuclei of interest. We employ Markov-chain Monte Carlo methods to sample a large number of low-energy constant (LEC) sets and calculate the relevant wave functions and the diverse components of the neutrinoless double-beta decay matrix element for each one of them. Similarly, we sample the unknown LEC in the neutrinoless double-beta decay operator allowing us to take into account the short-distance contribution to the matrix element. The resulting distributions for the latter possess intervals with 95% degree-of-belief which widths are smaller than the spread in the matrix element resulting from its calculation with the diverse nuclear models.

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Eduardo Coello Perez
Lawrence Livermore Natl Lab

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