Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Theoretical uncertainty for neutrinoless double-beta decay from chiral EFT[1] EDUARDO COELLO PEREZ, Lawrence Livermore Natl Lab — We study the neutrinoless double-beta decay of germanium 76 in a model that describes the parent and daughter nuclei as four valence nucleons on top of a germanium 72 core. The valence nucleons interact with each other via chiral nucleon-nucleon and three-nucleon interactions, while in-medium effects are modeled as an effective core-nucleon interaction. These interactions are fitted to reproduce neutron-proton phase shifts, deuteron binding energy, and the binding energies of the nuclei of interest as well as the energies of their first excited 0+ states. We employ Markov-chain Monte Carlo sampling to generate distributions for the low-energy constants of the chiral nucleon-nucleon contact interaction. The wave functions for the relevant ground states resulting from each set of parameters is employed to calculate the corresponding neutrinoless double-beta decay matrix element. The resulting distribution for the matrix element possesses a mode in good agreement with traditional shell-model calculations. The associated theoretical uncertainty comes from the interval with 95

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. This work was supported by the Laboratory Directed Research and Development grant 19-LW-039.

Eduardo Coello Perez
Lawrence Livermore Natl Lab

Date submitted: 10 Jan 2020 Electronic form version 1.4