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Neutrinoless double beta decay from lattice QCD AMY NICHOLSON, University of North Carolina, Chapel Hill UC Berkeley, CHIA CHENG, Lawrence Berkeley National Lab, EVAN BERKOWITZ, Julich, Forschungszentrum IAS, Julich , ENRICO RINALDI, Brookhaven National Lab, ANDRE WALKER-LOUD, Lawrence Berkeley National Lab, PAVLOS VRANAS, Lawrence Livermore National Lab, THORSTEN KURTH, NERSC, M. A. CLARK, NVIDIA, NICOLAS GARRON, University of Liverpool, BRIAN TIBURZI, City College, CUNY, HENRY MONGE-CAMACHO, DAVID BRANTLEY, Lawrence Berkeley National Lab, BALINT JOO, Jefferson National Lab, CALLAT COLLABORATION — Lepton number-violating neutrinoless double beta decay is a natural consequence of Majorana neutrinos and many BSM theories, and, if observed, could potentially explain the observed matter/anti-matter asymmetry in the universe. Several experimental searches for these processes using nuclear sources are planned and/or underway worldwide, and understanding quantitatively how neutrinoless double beta decay would manifest in nuclear environments is key for interpreting any observed signals. While long-range, light neutrino exchange is the most common mechanism studied, short-range interactions involving heavy mediator exchange may also contribute. In this talk I will give an overview of the microscopic observables relevant for experimental searches for neutrinoless double beta decay which may be calculated directly from QCD using lattice methods, and present results for short-range matrix elements contributing to pion exchange diagrams between nucleons.

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