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Modeling Charge and Light Yields in Liquid Argon with NEST JUSTIN MUELLER, Colorado State University, NOBLE ELEMENT SIMULATION TECHNIQUE (NEST) COLLABORATION — NEST (Noble Element Simulation Technique) is a C++ package, with optional GEANT4 or Python integration, that allows for the precise simulation of charge and light yields in noble elements across several orders of magnitude of energy and drift fields. This is accomplished through empirically developed models and encompasses a variety of past xenon experimental results. This talk covers the work that has been done to develop similar models for argon. Proper simulation of charge and light yields in argon is increasingly more important with the advent of large-scale argon-based experiments such as DarkSide-50, the future Deep Underground Neutrino Experiment (DUNE), and the argon-based portion of the COHERENT experiment, CENNS-10. NEST is primarily used for energy scales typical in direct dark matter detectors or double beta decay searches, but also covers regions of interest for events in neutrino experiments such as those caused by supernovae neutrinos, solar neutrinos, or coherent elastic neutrino-nucleus scattering.

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