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## Seeing the Invisible: Benefits and Capabilities of MeV-Scale Reconstruction in Single-Phase LArTPCs

The recent demonstration of MeV-scale reconstruction capabilities in liquid argon time projection chambers (LArTPCs) allows for a variety of new physics studies. We examine the benefits of MeV-scale reconstruction in single-phase LArTPCs, in particular on supernova neutrino reconstruction, a major goal of DUNE. We also explore the utility of MeV-scale reconstruction for neutron calorimetry, particle identification and beyond the Standard Model physics. We find that these physics topics and reconstruction goals benefit from the addition of MeV-scale reconstruction information. We also examine the detector properties that limit these capabilities, including  $^{39}\text{Ar}$  contamination, pileup, and detector thresholding effects.

### Mini-abstract

Why should we care about MeV-scale reconstruction in LArTPCs?

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