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A Dual-Phase Argon Ionization Detector for the Measurement of Nuclear Quench Factors and Coherent Neutrino Scattering¹ SAMUELE SANGIORGIO, ADAM BERNSTEIN, Lawrence Livermore National Laboratory, MICHAEL FOXE, Pennsylvania State University, CHRIS HAG-MANN, Lawrence Livermore National Laboratory, TENZING JOSHI, University of California-Berkeley, IGOR JOVANOVIC, Pennsylvania State University, KAREEM KAZKAZ, Lawrence Livermore National Laboratory — Dual-phase detectors based on noble elements are widely used for measuring low-energy nuclear recoils, for example in Dark Matter or Coherent Neutrino Scattering (CNS) searches. We have constructed a dual-phase Argon detector to measure the nuclear ionization quench factor of Argon from 10 keV down in the sub-keV range using a neutron beam and also a newer technique based on nuclear resonance fluorescence. The detector is also a prototype for a larger one to measure CNS at a nuclear reactor. We will present an overview of our program and report on the commissioning of the dual-phase prototype, with details on the proposed techniques for the quench factor measurements.

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