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A Gaseous Argon-Based Near Detector to Enhance the Physics Capabilities of DUNE

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DUNE aims to measure CP violation in the leptonic sector, observe supernova burst neutrinos, and detect rare processes such as proton decay. To achieve these goals, DUNE will use a highly capable suite of near detectors. The DUNE Near Detector complex for Phase II includes ND-GAr, a magnetized high-pressure gaseous-argon TPC (HPgTPC) surrounded by a calorimeter. Due to the low detection threshold of HPgTPC, ND-GAr will be able to constrain one of the least understood sources of uncertainty in the oscillation analysis: nuclear effects in argon at the neutrino interaction vertex. Ongoing R&D efforts for HPgTPC will be discussed.

Early Career

Yes

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