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A High Resolution Fine Grained Tracker as the Reference Near Detector for DUNE (12' + 3')

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This talk presents the reference near detector for DUNE is a fine-grained tracker (FGT). The FGT comprises straw tube tracker (STT), with continuous transition radiation (TR) measurement capability and having an average density of liquid-hydrogen, surrounded by electromagnetic calorimeter (ECAL). The STT and ECAL are embedded in a large dipole magnet. Muon detectors, composed of RPCs, instrument iron-yokes, and the downstream and upstream stations outside the magnet. Neutrino targets including hydrocarbon, argon-gas, calcium, and graphite interleave the STT. The FGT is designed to precisely measure all four species of neutrinos via their charged current interactions: (anti-)muon neutrinos and (anti-)electron neutrinos. The high resolution of the detector allows measurement of the ID and momentum vectors for electrons, muons, pions, protons, and kaons. Anticipated physics capabilities of the FGT are outlined.

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