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# A Liquid Argon Detector for the Far Forward Neutrinos at the LHC

The FASER experiment detected, for the first time, neutrinos from pp collisions in the LHC. These neutrinos have energies between the most energetic neutrinos ever produced by human-made sources until now and high-energy cosmic neutrinos. This discovery opens a new window for studying TeV-energy neutrinos of all three flavors, as well as BSM and QCD physics. A liquid argon detector with high spatial and energy resolution in a wide energy range would allow for looking into the details of neutrino interactions and dark matter searches in the far forward direction of the LHC. However, designing such a detector presents many challenges, including muon backgrounds, requirements on the readout and trigger, and identification of tau neutrinos. A Preliminary examination of event rates and backgrounds suggests that a liquid argon detector is feasible and groundbreaking, with fruitful unexplored physics waiting to be discovered.

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