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Nucleon decay search with DUNE

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The Deep Underground Neutrino Experiment (DUNE) is an international project aiming at neutrino physics and astrophysics and a search for phenomena predicted by theories beyond the standard model. The excellent imaging capability of Liquid Argon Time Projection Chamber (LArTPC) technology, particle tracking and identification utilized in the Far Detector allow the experiment to achieve high sensitivity to various rare processes. Grand Unified Theories (GUTs) predict a baryon number non-conservation effects, such as nucleon decay. Some GUTs, including those based on Supersymmetry (SUSY), favor nucleon decays with a kaon in the final state. Here we discuss the sensitivity of DUNE to some nucleon decay modes. With full event simulation and reconstruction using the LArSoft package, we have investigated the background to nucleon decay events from atmospheric neutrino interactions, and particle misidentification and utilized machine learning techniques to enhance the discrimination between signal and background.

I read the instructions

Secondary track (number)

2

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