

Deep Learning for Liquid-Scintillator-Based Double-Beta Decay Searches

Liquid scintillator-based detectors are one of the leading detector technologies in the search for neutrinoless double beta decay. They are currently limited by naturally occurring and spallation induced backgrounds. In the future they will be limited by the neutrino-electron scattering of boron-8 solar neutrinos. With the advancements in machine learning technology, we attempt to classify two electron events from one electron events using a Convolutional Neural Network, a common algorithm used in Computer Vision. We trained our network with Monte Carlo simulated truth data, and designed a 2D pressure map to evaluate the training results under different detector configurations. The ultimate goal of this project would be to apply the sophisticated neural network to real detector data, recognize desired events and reject background.

Session and Location

Monday Session, Poster Wall #70 (Auditorium Gallery Right)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)