9th SYMPOSIUM ON LARGE TPCs FOR LOW-ENERGY RARE EVENT DETECTION



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A low energy muon neutrino event reconstruction for MicroBooNE

MicroBooNE is a Liquid Argon Time Projection Chamber (LArTPC) neutrino experiment on the Booster Neutrino Beamline at the Fermi National Accelerator Laboratory, with an 85-tonne active mass.

One of MicroBooNE's primary physics goals is to investigate the excess of electron neutrino events seen by MiniBooNE in the [200-600] MeV range.

MicroBooNE will constrain the intrinsic electron neutrino component of the beam by measuring the muon neutrino spectrum.

Several low-energy excess analyses are taking place in parallel, using independent reconstructions and selection schemes.

This talk will focus on a low-energy excess analysis that makes use of deep learning algorithms applied to the high-resolution images provided by the MicroBooNE LArTPC.

I will present a novel 3D event reconstruction based on computer vision tools and a stochastic search algorithm that aims to reconstruct low energy events with high resolution.

I will then present validation studies verifying the good agreement of our simulation to our muon neutrino data.

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