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MeV-Scale Physics in MicroBooNE

MicroBooNE is a near surface Liquid Argon Time Projection Chamber neutrino experiment along the Booster Neutrino Beam at Fermilab. Low electronics noise levels and millimeter spatial resolution allow this detector to be sensitive to MeV-scale interactions. Near surface location of the detector makes it challenging to distinguish low energy nuclear de-excitation photons and neutron scatters caused by neutrino interactions, from cosmic ray backgrounds. This poster presents a novel reconstruction method for these MeV scale signatures in MicroBooNE, and its application to a measurement and rejection of the cosmic ray background. This work constitutes the first characterization of cosmogenic and radiological backgrounds at the MeV scale in a LArTPC neutrino detector. Finally, we present some preliminary measurements of MeV energy signatures produced in BNB neutrino interactions, and highlight the application of this technique to studies of low energy neutrino interactions from core-collapse supernovae and muons decaying at rest.

Mini-abstract

A novel reconstruction method for MeV-scale energy signatures in the MicroBooNE detector.

Experiment/Collaboration

MicroBooNE

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