Contribution ID: **302** Type: **not specified**

First Run of the LArIAT Testbeam Experiment

Tuesday, 4 August 2015 17:12 (18 minutes)

The liquid argon time projection chamber (LArTPC) is a relatively new and powerful technology favored by several current and future neutrino experiments. Its ability to resolve particle interactions as detailed three-dimensional images and measure deposited energy over a large target volume make it ideal for precision neutrino physics measurements and searches for rare processes like proton decay. A dedicated effort is needed to calibrate these detectors. The LArIAT (Liquid Argon In A Testbeam) Experiment aims to characterize the response of a LArTPC to the particles often seen as final products of ˜1 GeV neutrino interactions using a beam of particles with known momenta, produced from a high-energy pion beam at the Fermilab Test Beam Facility (FTBF). In Phase I of LArIAT, the ArgoNeuT cryostat was reused with a refurbished TPC of 170 liter active volume. It's unique in its use of cold readout electronics as well as its powerful light collection system, which uses PMTs to detect light from reflector foils coated in a thin layer of wavelength shifting tetraphenyl-boutadiene (TPB) mounted along the inner field cage walls of the TPC. Data-taking will run through the end of June, and the collected data will help in understanding electron recombination behavior, shower reconstruction, particle identification, muon sign determination, pion and kaon interactions in argon, and the use of scintillation light for calorimetry. The status of the data analysis from LArIAT's Phase I run will be presented.

Oral or Poster Presentation

Oral

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Session Classification: Neutrino Physics

Track Classification: Neutrino Experiment