

MicroBooNE Quarterly Report - January 2015

1. Event Reconstruction Progress (Wes Ketchum)

There has been much progress with the event reconstruction. Figure 1 shows a comparison between the integrated ADC charge and the Monte Carlo (truth) integrated charge, comparing different hit reconstruction algorithms against each other. While each performs reasonably well, the “CCHit” algorithm appears to provide significantly better resolution in the induction planes. Comparisons like these for a variety of reconstruction objects are being performed to assess performance of individual algorithms. Figure 2 shows the momentum resolution of muon tracks using a multiple-Coulomb-scattering algorithm as a function of momentum with the Monte Carlo simulation. The resolution is close to the ideal scenario, where the momentum equals the momentum from calorimetry. There has also been progress in reconstruction efficiency from use of the Cambridge University Pandora package. Figure 3 shows the track reconstruction efficiency for various particle types as a function of the number of true hits. The efficiency approaches 100% when the number of true hits surpasses 100, which is true for most long muon tracks in our simulation.

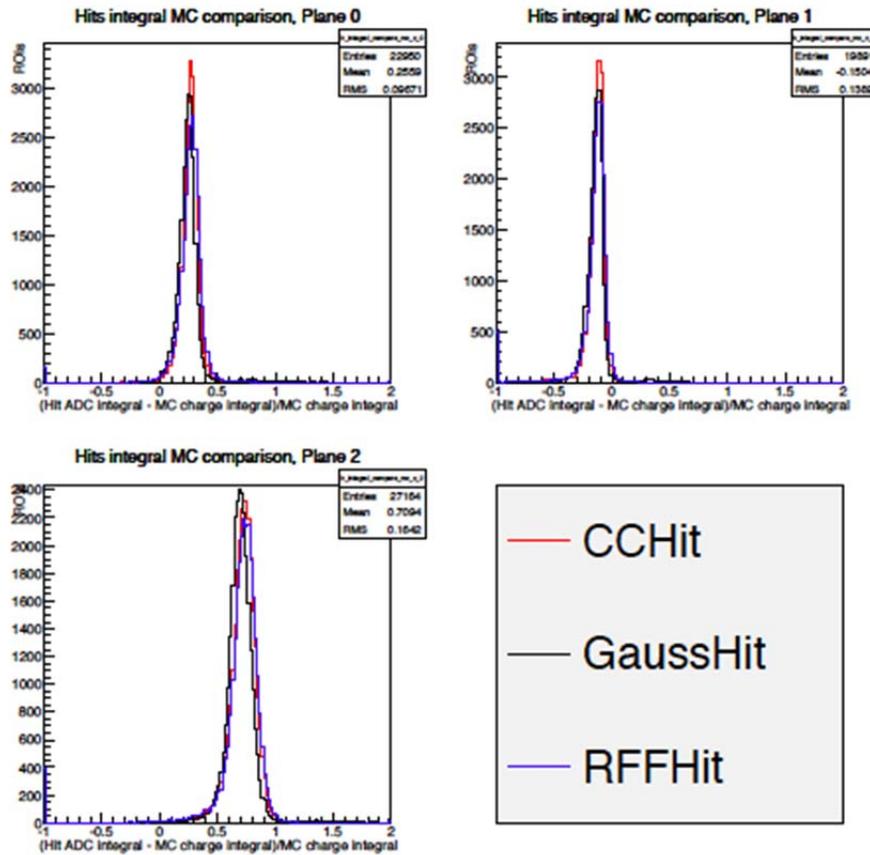


Figure 1: A comparison between the integrated ADC charge from reconstruction (for three different hit-finding algorithms) and the Monte Carlo (truth) integrated charge.

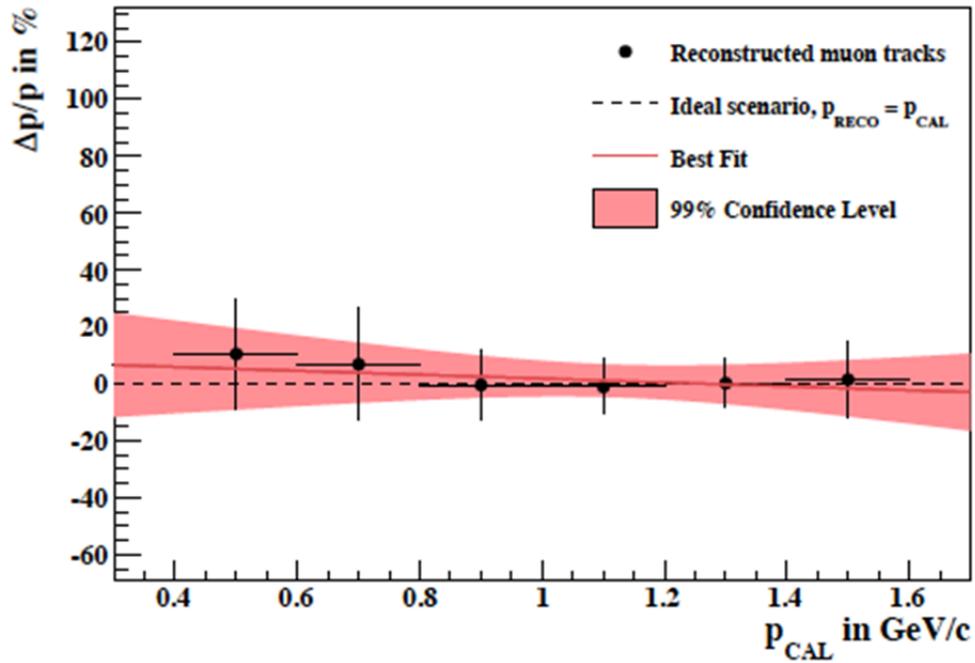


Figure 2: The momentum resolution of muon tracks with the Monte Carlo simulation.

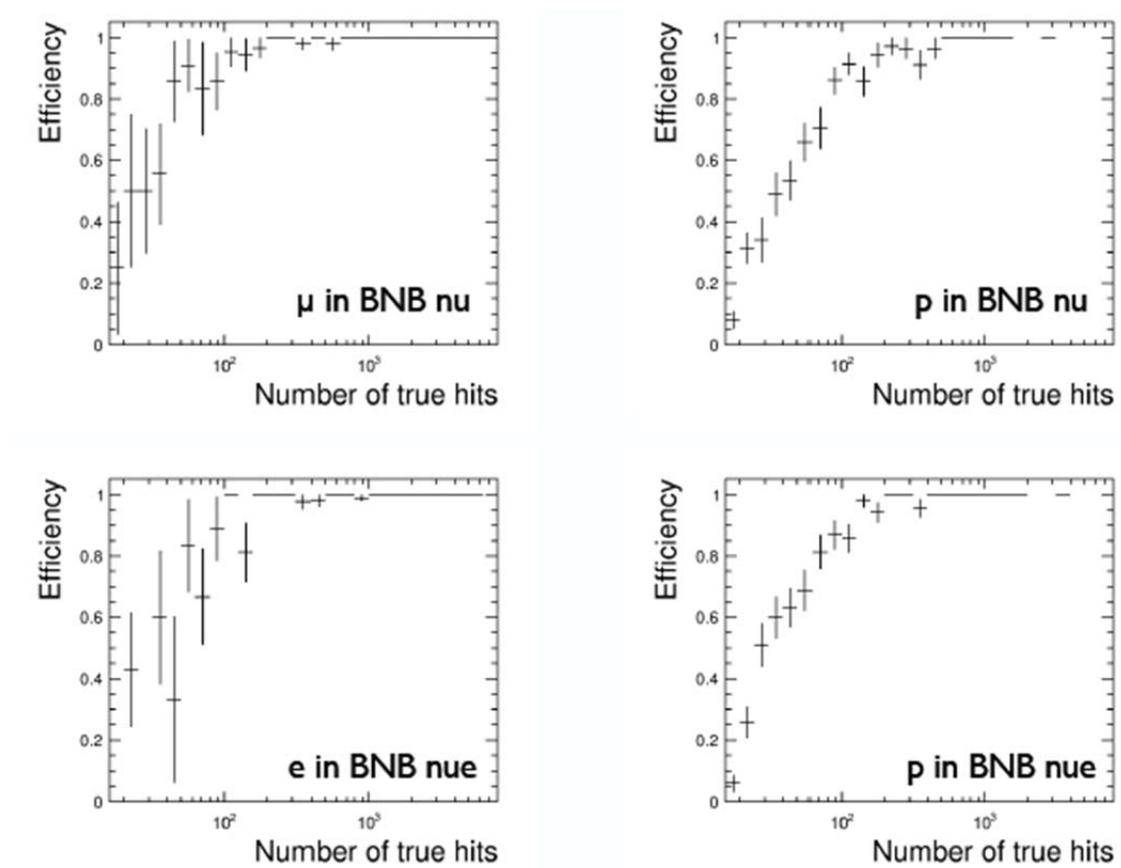


Figure 3: The track reconstruction efficiency for various particle types as a function of the number of true hits using the Pandora package.

2. Electronics and DAQ Progress (Wes Ketchum)

The warm electronics installation at LArTF has been completed, and we are able to power and readout data from the cold electronics. Figure 4 shows preliminary noise levels measured with some of the cold electronics powered and configured. The noise levels are similar to previous results and are reasonable. We continue to make progress on the DAQ, having all electronic components read out in the run control software. Final checks on the configuration routine for the electronics are being completed, and we are finalizing updates to the monitoring of the DAQ processes.

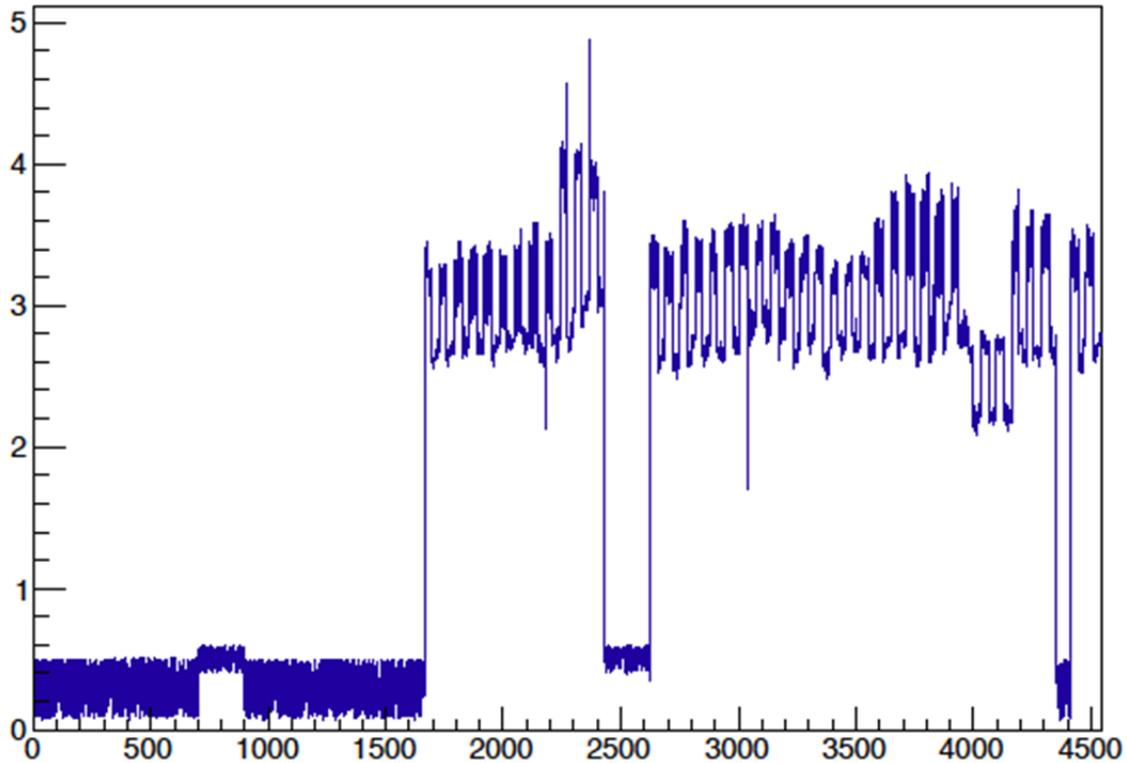


Figure 4: Preliminary noise levels measured with the electronics powered on and configured.