Continued Low-lumi + background test. 1

1. Generated scripts to add 5-nA runs with background files.
2. Reconstruction of denoised files was VERY slow, $\approx 4.00 \pm 0.04$ *sec*/*evt*.
3. Raffaella suggested to keep data files in the remote, user directory (already doing that) and ...
4. Remove the Central Detector services from the yaml file.
   - Removed services: CVTFP, CTOF, CND, BAND, CVTSP.
   - Worked! Reconstruction time dropped to $\approx 1.57 \pm 0.03$ *sec*/*evt*.
5. Chris Dilks (during Software Office Hours) suggested increasing the heap allocation for recon-util. He created a version with twice the heap space (‘`java -Xmx1536m`’ to ‘`java -Xmx3072m`’).
   - Submitted to the farm and it crashed (details below).
   - It worked when I ran it interactively on the farm (details below).

Continued Low-lumi + background test. 2

6. Error message from priority queue:

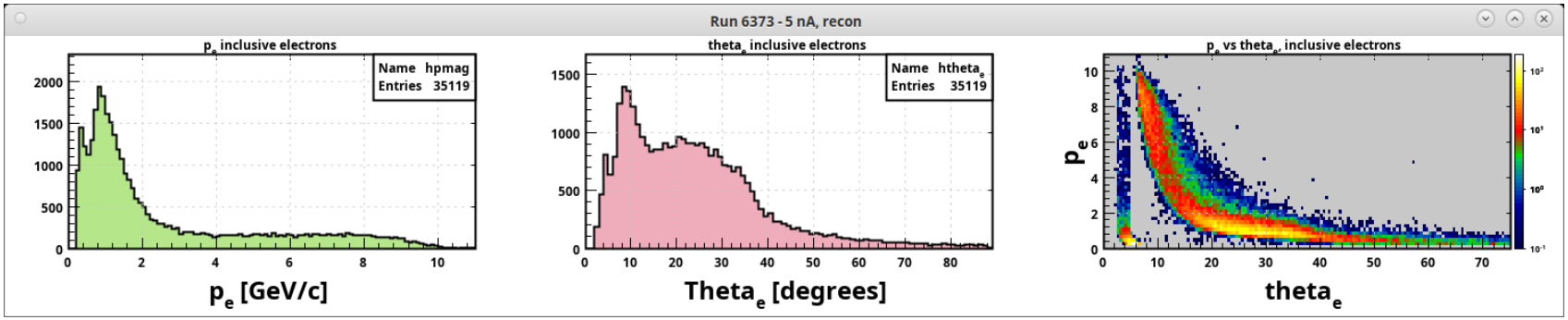
```
.//recon-util-with-more-heap:  line 14:  3432090 Killed
java -Xmx3072m -Xms1024m -XX:+UseSerialGC -cp
"$CLAS12DIR/lib/clas/*:$CLAS12DIR/lib/services/*:$CLAS12DIR/lib/utils/*"
org.jlab.clas.reco.EngineProcessor $* slurmstepd:  error:  Detected 1
oom_kill event in StepId=54264217.batch.  Some of the step tasks
have been OOM Killed.
```

7. Results from interactive running.
   - Compared file dumps and results are similar to standard version.
   - Average reconstruction time was 133 ± 7 *ms*!!
   - Emailed Chris with these results.

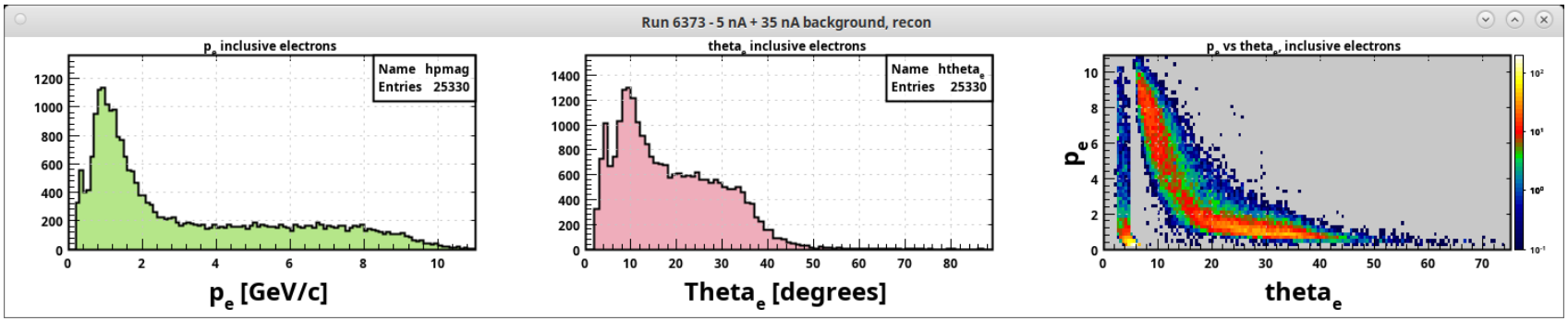
Additional Slides

Combine Low-luminosity data with Background runs

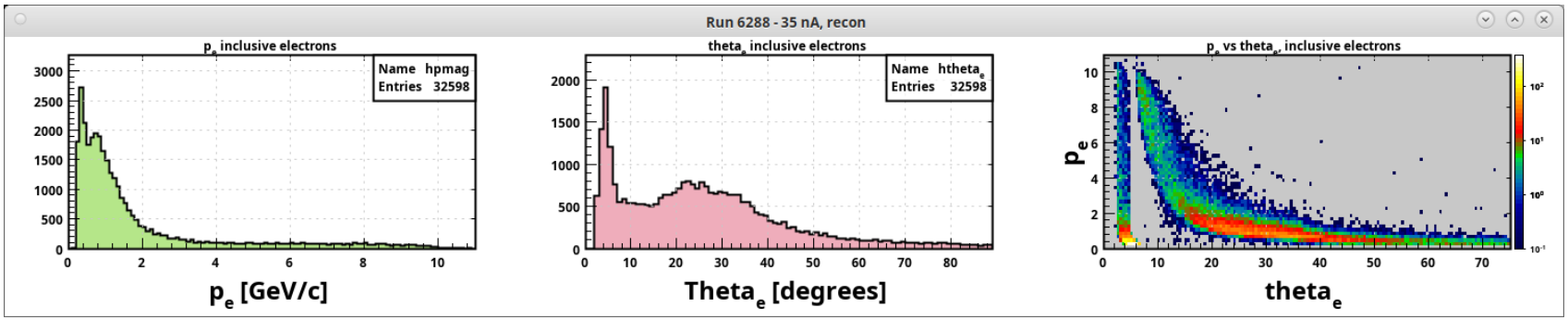
Clean, 5-nA results (run 6373, spring 2019, 10.6 GeV). First 50k events.



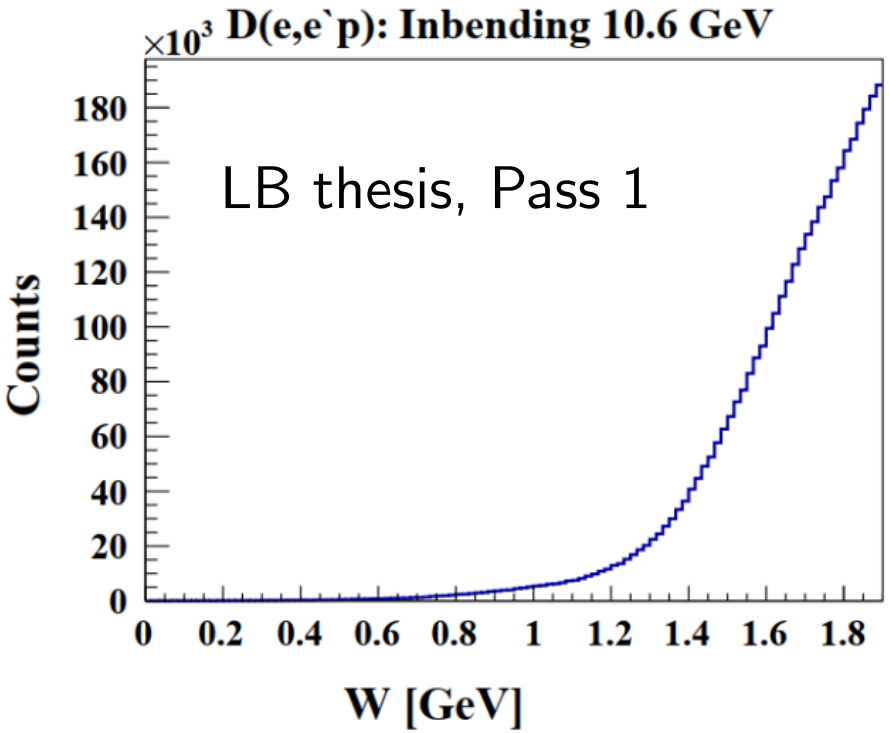
5-nA data (run 6373) merged with 35-nA background and reconstructed. First 50k events.

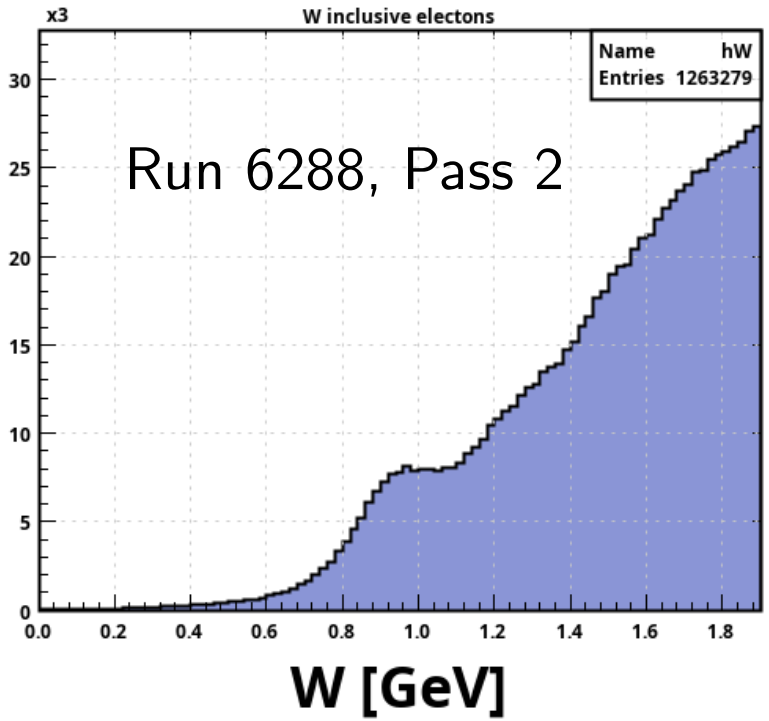


35-nA data (run 6288, spring 2019, 10.6 GeV) reconstructed. First 50k events.



Some Very Preliminary Results

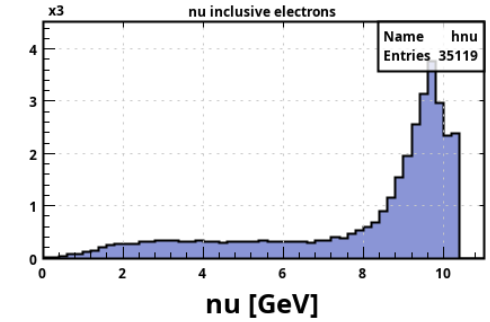
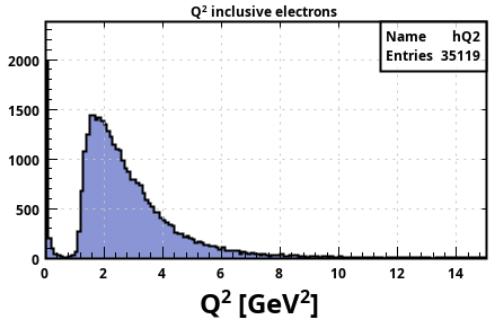
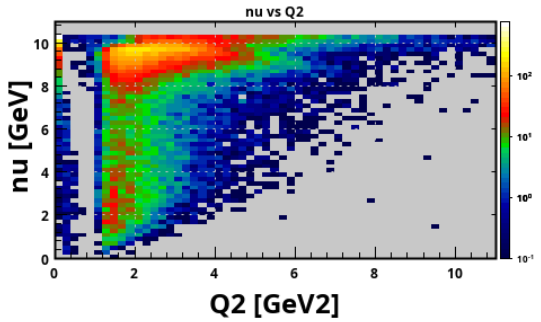
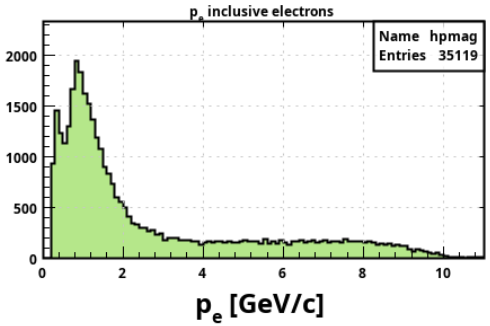
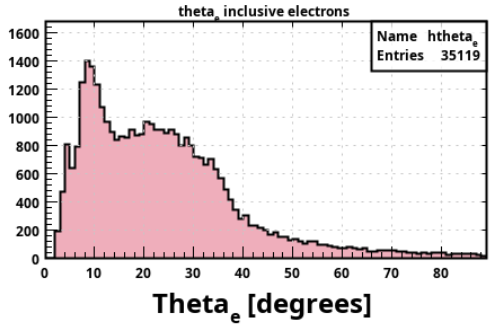
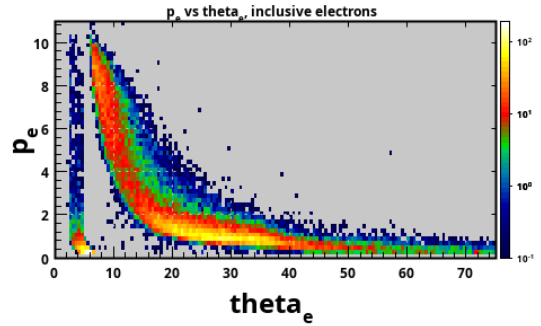
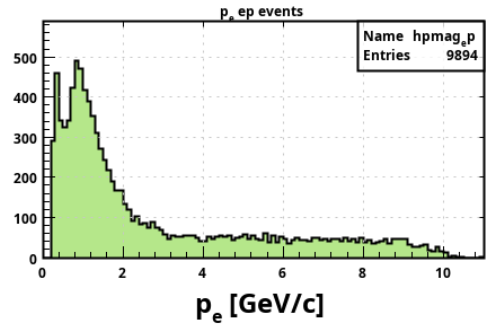
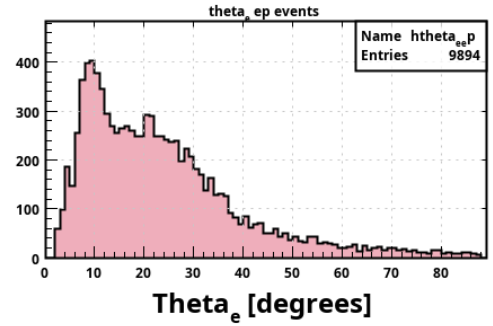
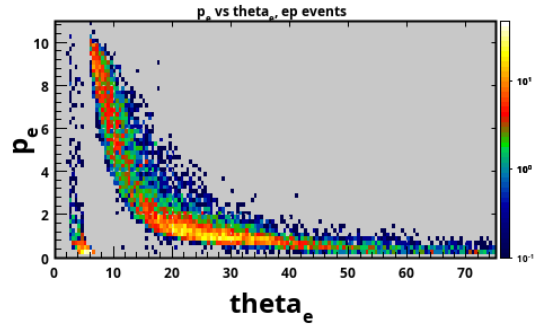




Next Steps

1. Continue checking results in initial analysis.
2. Develop scripts for ifarm to analyze complete files.
3. Getting analysis using Lamya's code working.
4. Simulation to study luminosity effects.

Initial Cuts on Lamya's Plots

electron	proton	neutron
pid = 11 v_z vertex position $N_{ph} > 2$ PCAL fiducial V, W > 14 cm cut DC fiducial cut for 3 DC regions SF vs. P_{ele} $\pm 3.5\sigma$ Diagonal cut chi2pid $\lvert\chi^2\rvert < 3$ cut Minimum PCAL E_{dep} > 60 MeV	Positive charge particle hit calorimeter	Neutral charge particle hit calorimeter

More distributions - Run 6373, 5 nA, sprint 2019, 10.6 GeV