



Test Beam PSF Analysis News

PSF Analysis Update

Brian Baughman, UCSC



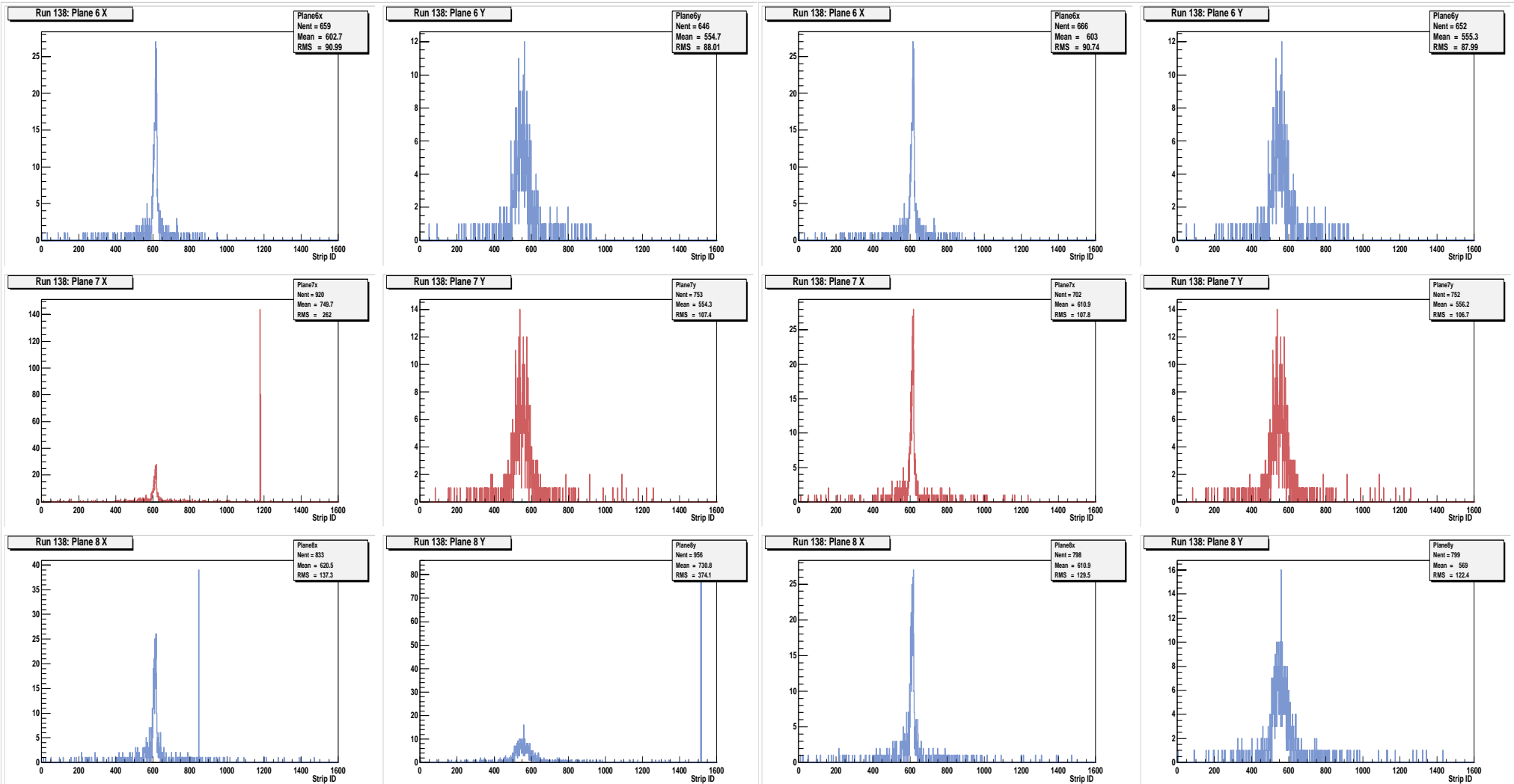
Test Beam PSF Analysis News

Tb_recon has been edited to allow removal of bad strips before reconstruction so analysis is not effected. Implementation is now achieved by adding the line:

```
SiCalibLayers badStripsFileName S D:/brian/tb_recon/badStripsList.txt
```

Before Removal

After Removal





Test Beam PSF Analysis News

•Cuts Made in ALL analysis:

- vertex != first plane
- vertex != dead zone
- $10 \text{ MeV} < \text{eneCal} < \text{Beam Energy}$

•GetGoodG cut efficiency.

Analysis has been performed on the efficiency the getGoodG cut from the ESPID class. This function is supposed to return true if the event contains one good gamma.

To test the efficiency we analyzed Run 300, 116827 events total using the same code only modifying the cut implemented.

With getGoodG NOT implemented : 4.977%

With getGoodG implemented: 0.427%

Here we see that the efficiency of dramatically drops when getGoodG is implemented.



Test Beam PSF Analysis News

•Statistics

The low efficiency obtained after implementing the getGoodG cut motivated a study of the total number of gamma events available. We found the following:

<u>Run Type</u>	<u>#Events</u>	<u>After getGoodG</u>
20 GeV 0 deg	4874652	20814
20 GeV 45 deg	608517	2598
20 GeV 60 deg	690811	2949
5 GeV 0 deg	916505	3913
5 GeV 30 deg	576783	2462
5 GeV 60 deg	708847	3026
2 GeV 0 deg	817340	3490
2 GeV 30 deg	423916	1810
2 GeV 60 deg	314671	1343



Test Beam PSF Analysis News

•Our Cut

We then created our own cut based on the correlation between calorimeter data and tagger data. The cutting variable was defined as $(eneTagger - eneCal)/(eneTagger)$ and we required this value to be < 0.5 .

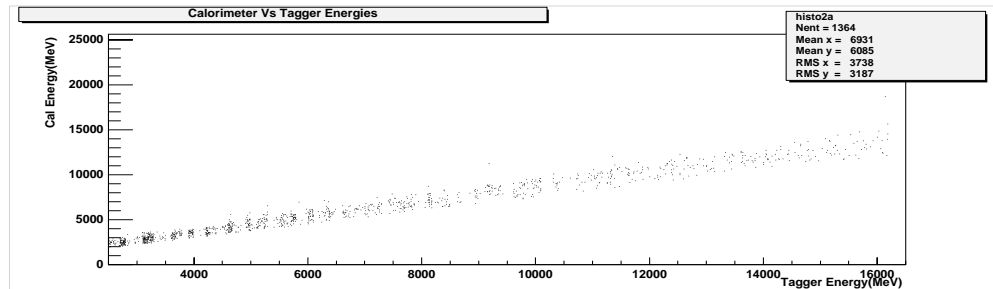
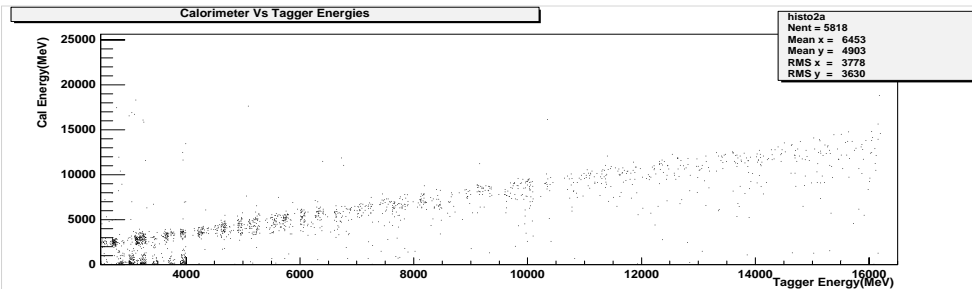
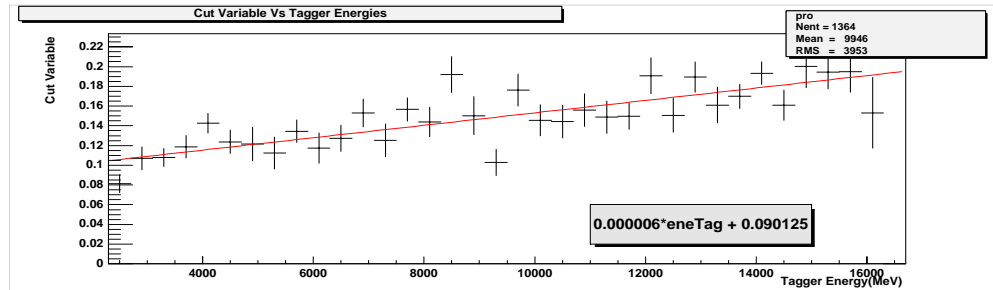
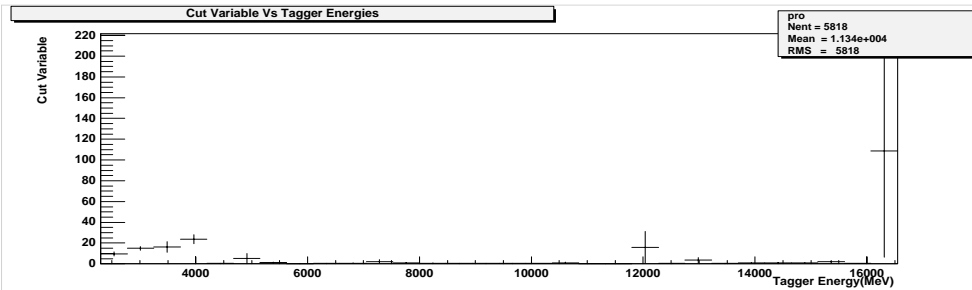
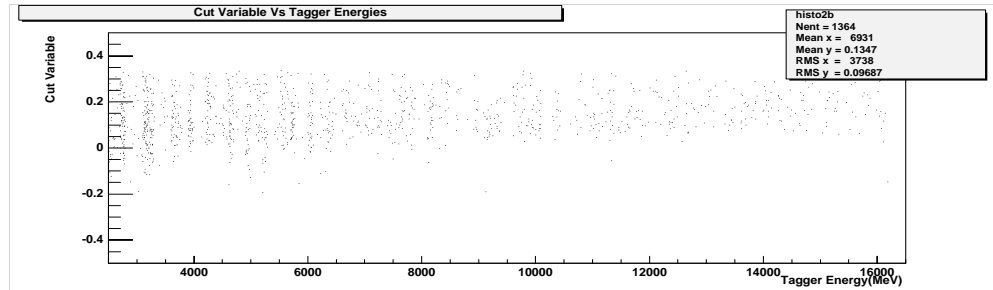
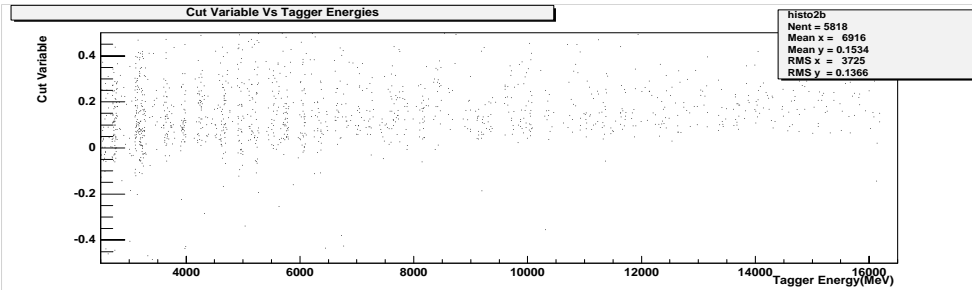
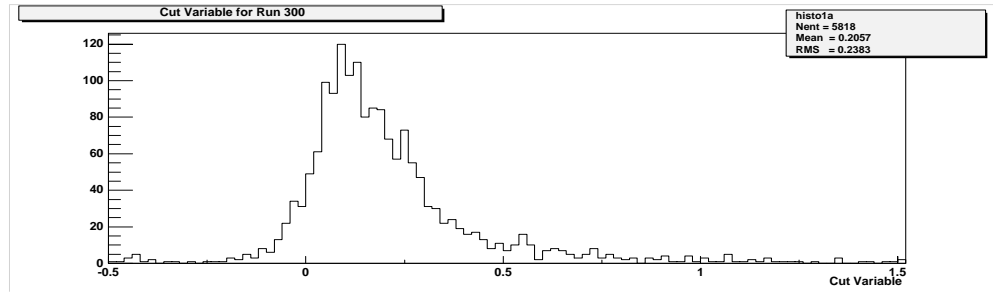
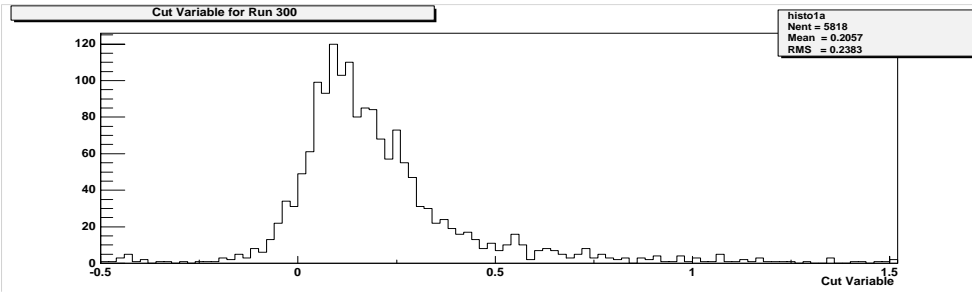
With our cut implemented: **1.167%** $(eneTagger - eneCal)/(eneTagger) < 0.5$



Test Beam PSF Analysis News

Before Our Cut

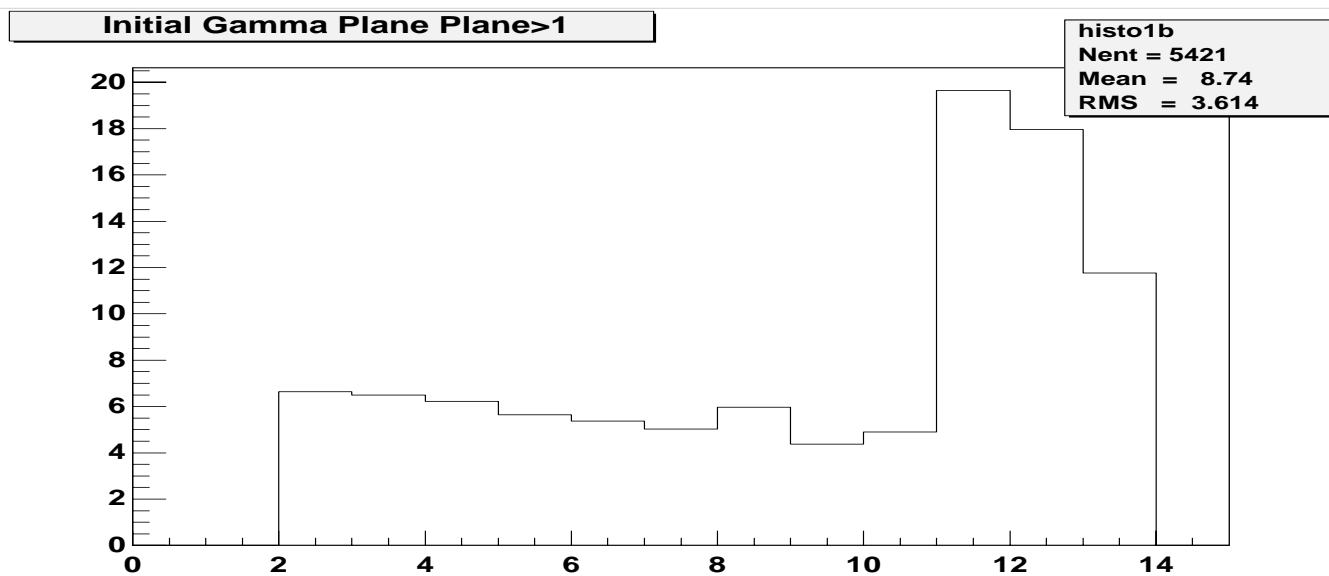
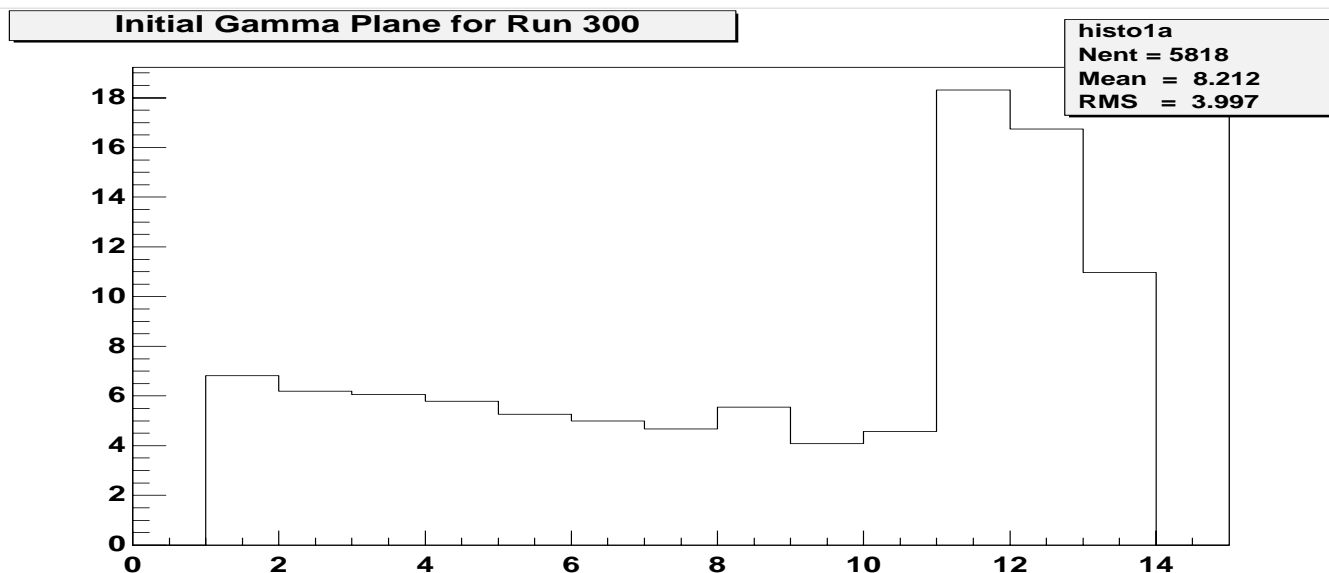
After Our Cut





Test Beam PSF Analysis News

Tb_recon appears to be reconstructing the gammas correctly and we see that the initial plane distribution is as we would expect.





Test Beam PSF Analysis News

PSF analysis is progressing and the results appear worse than expected however analysis is not complete and more events are needed to make statistical fluctuations minimal.

