

PrimEx Calibration Update



16th April 2020

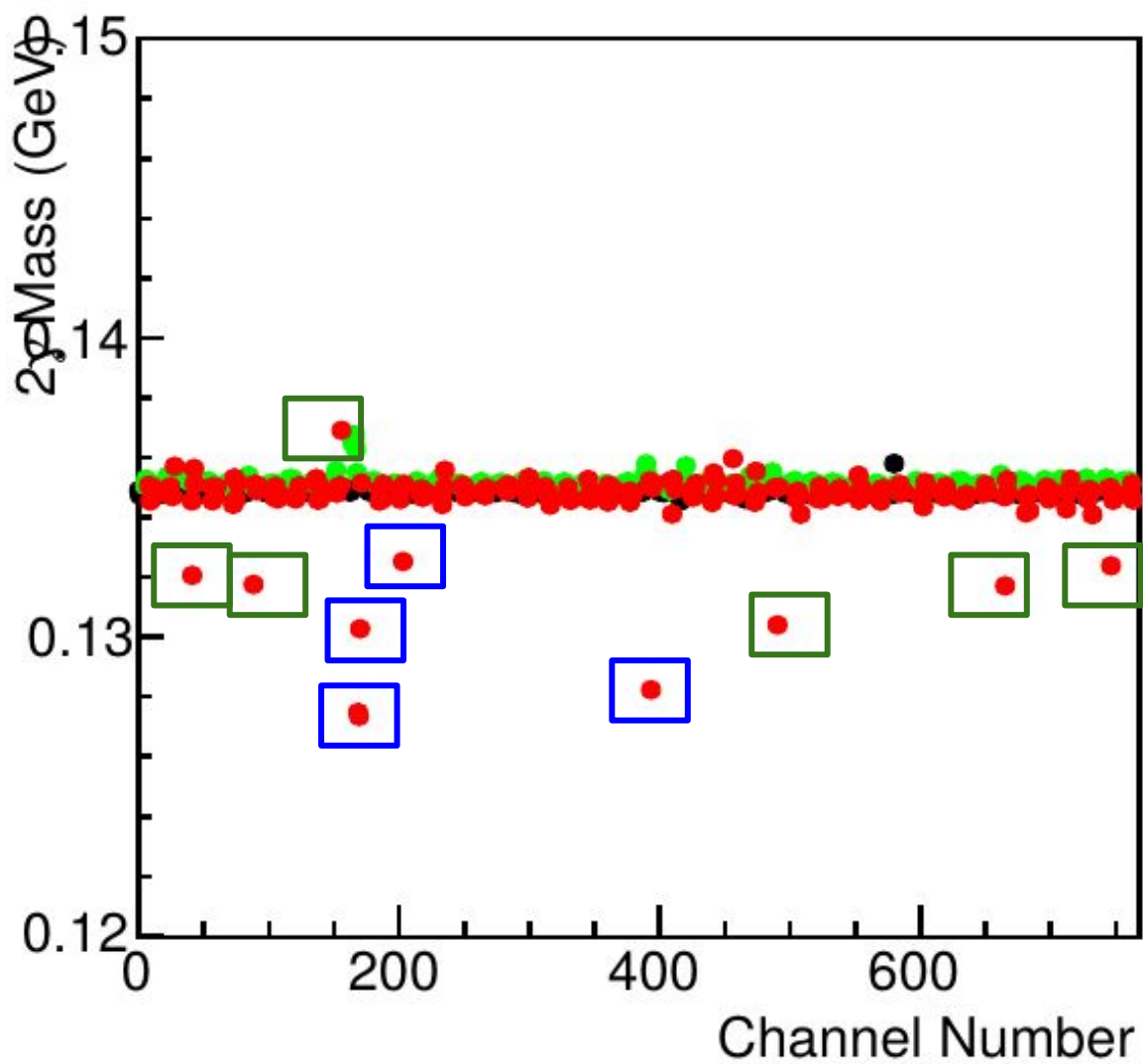
Summary

So far the calibrations are run on He target with CDC On from runs 61378 to 61956.

1. Started off with Spring 2020 GlueX calibrations
2. Fixed the vertex positions (beamX,beamY,target_Z)
3. Extended the range of Pi0 fits from 0.07-0.2 GeV. Extending this range captured the pi0 mass in Layer 3 Channels. The fits now produce the right mass
4. No nonlinear corrections were applied for this calibration.
5. Completed 6 iterations so far. All the layers including Layer3 have converged to a mean of about 0.1346 GeV (Mean of the distribution)
6. The pi0 masses for Layer 1 and 2 seem to be tightly aligned to 0.1346 GeV. The Layer3 channels also have converged to 0.1346 but with comparatively more spread than Layers 1 and 2.
7. This is because of the signal to noise ratio in Layer3. The Layer3 channels has wider sigma than the Layer1 and 2. The Magnetic field (B) was off for the PrimEx runs and also track vetoing was poor for these runs.
8. There are some outliers in Layer3 channels. Fixing them by manually fitting them. Some of the channels have irresolvable signal to noise ratios, and therefore cannot be fit. Refer Channel_fits.pdf
9. The mean/sigma as a function of iteration has quickly converged (except the Iteration3 which pushed it up)
10. Running another iteration to verify the behaviour of mean/sigma. So far the mean/sigma for the calibration is 0.087) where as GlueX calibration converged with a mean/sigma = 0.058

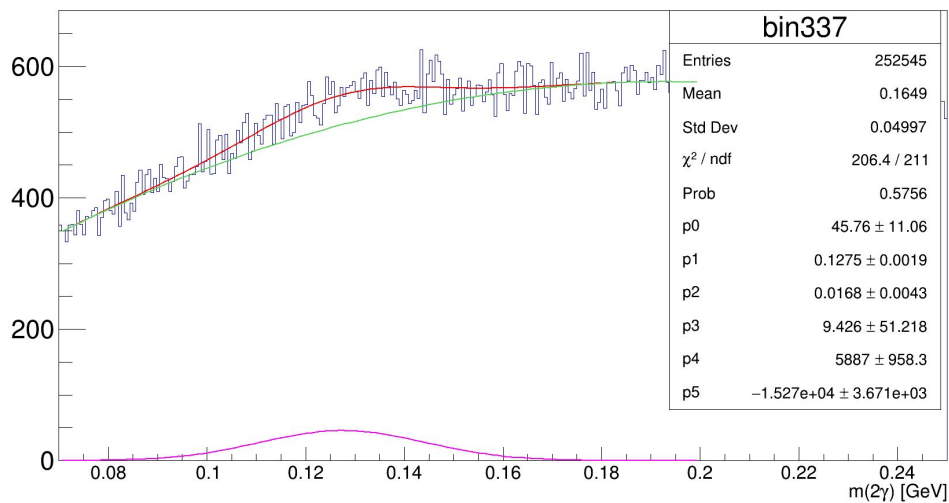
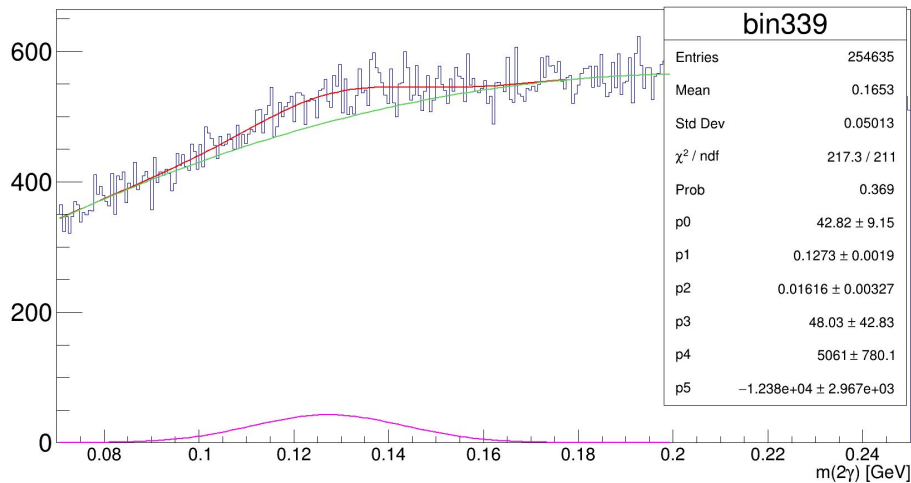
Summary of Channels with outliers in layer3

-  Irresolvable signal to noise channels
-  Resolvable signal to noise channels which are converging as function of iterations

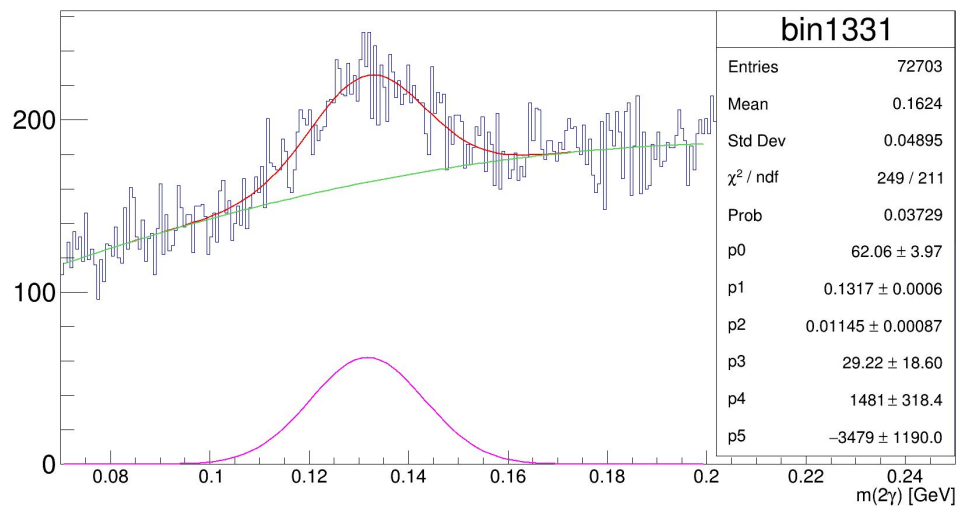
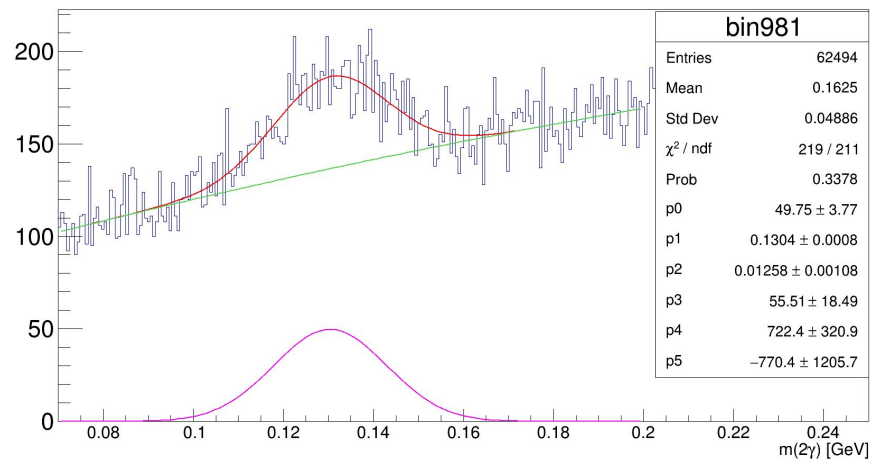


irresolvable signal to noise channel example

IDs (x axis of plot in previous page) :
168, 170, 172, 202, 393

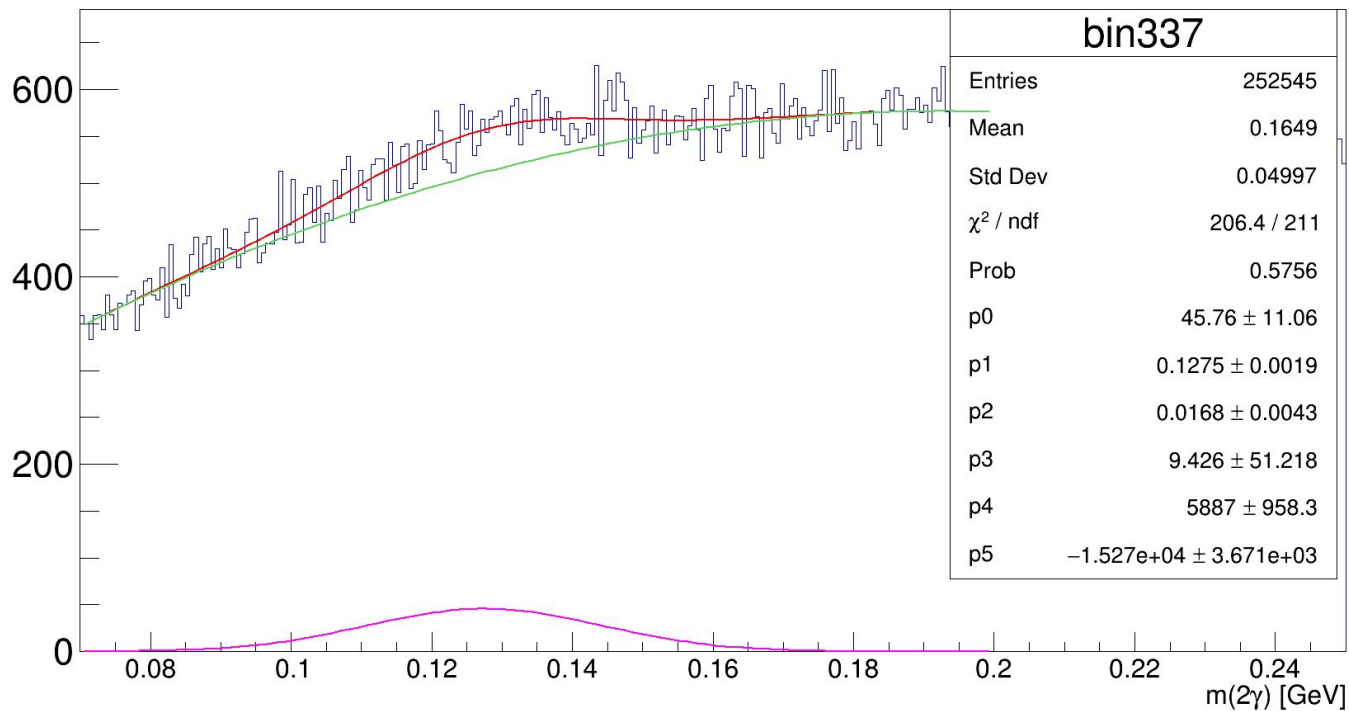


Outliers with resolvable signal to noise ratios example. These are converging with iterations



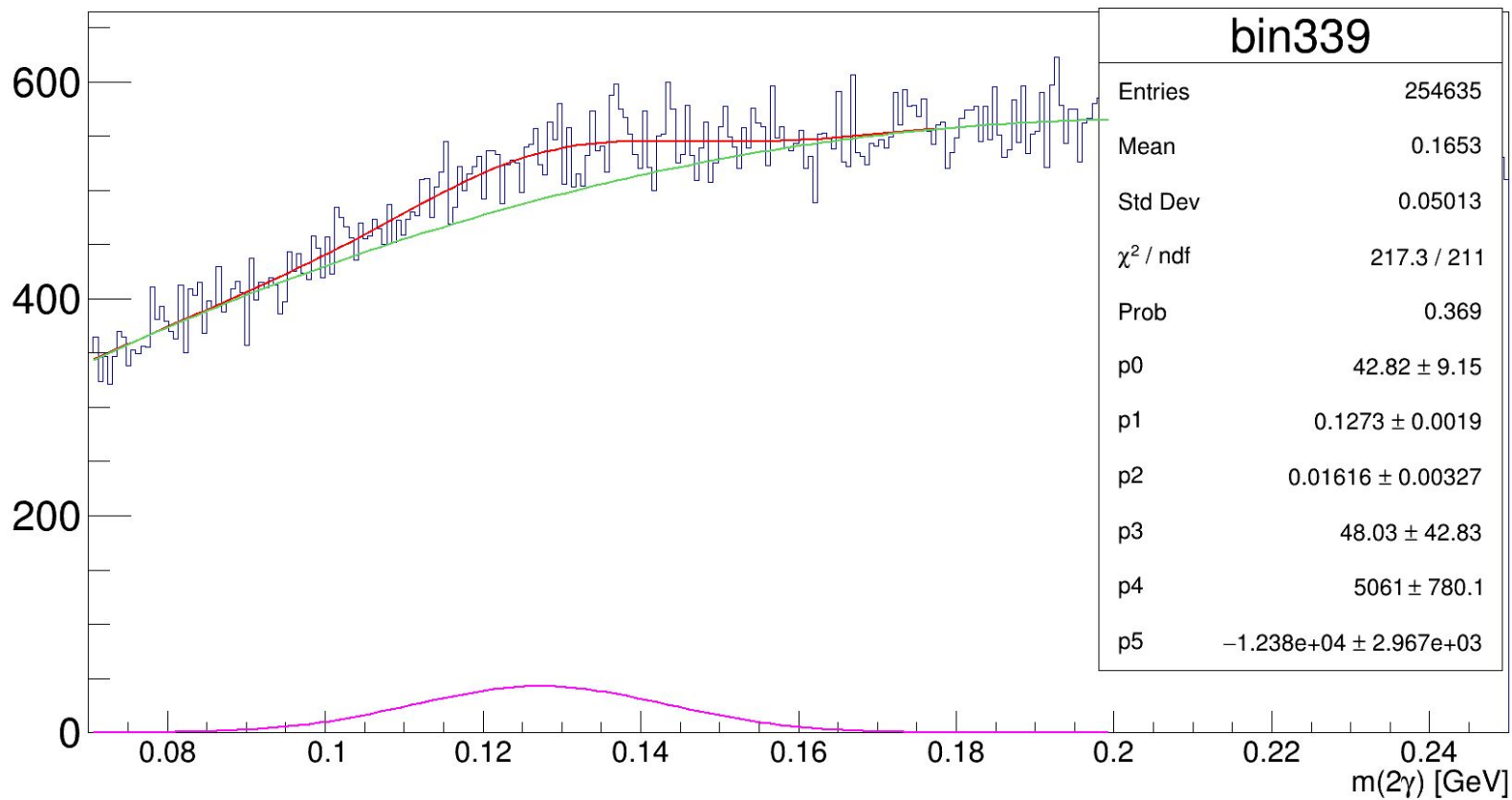
Irresolvable signal to noise channels.

Channel 168

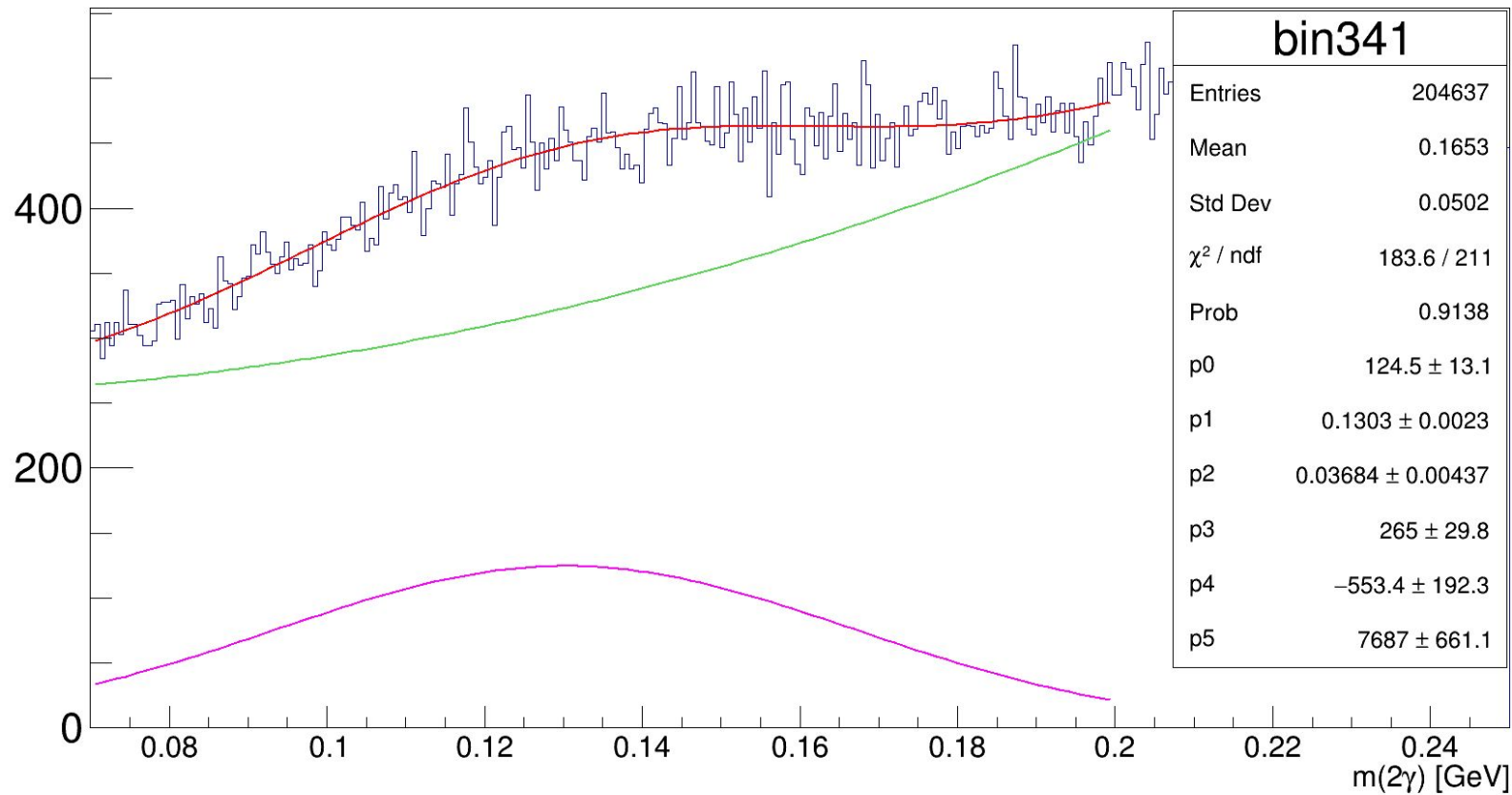


BACK UPS

Channel 170



Channel 172



Channel 393

