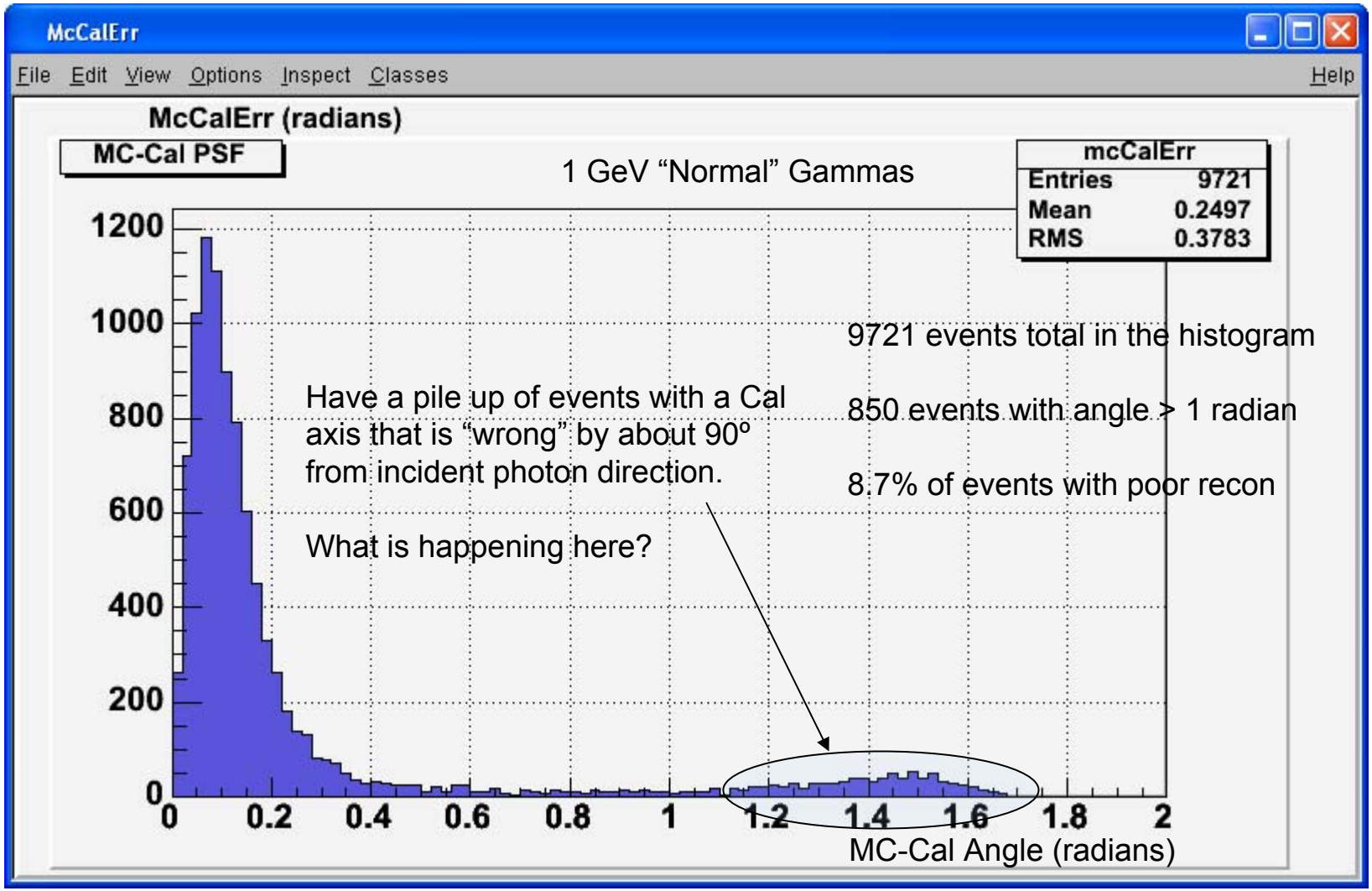
Cal PSF

1 GeV Normal Gammas



Bad Axis Localization

It's a gap problem – only on-axis problem?

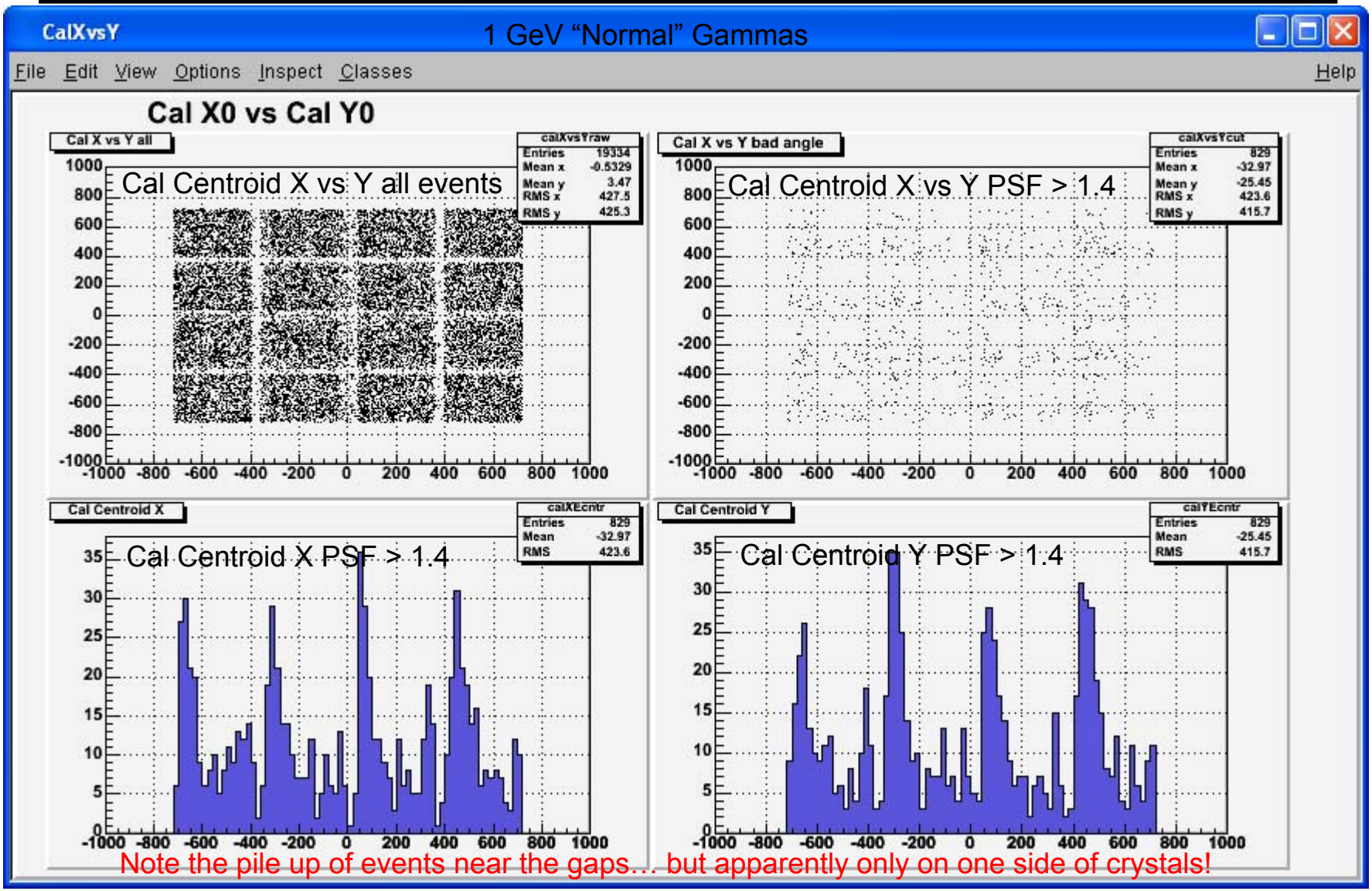


Illustration of Problem w/ Event Display

1 GeV Normal Gammas

Gap problem "easy" to see in Event Display:
- Restrict launch point to x=400, y=400, z=1000

Not hard to find example events with this source… (Event #6 in this example)

The problem with this event is that the "isolated" crystal has an energy consistent with those crystals along the main shower axis… and there is no hit "in the right place" for this layer. This crystal pulls the moments axis away from its true value.

Once a bad axis calculated, not much hope for recovery in the current iterative analysis as it throws out outliers based on distance from axis…

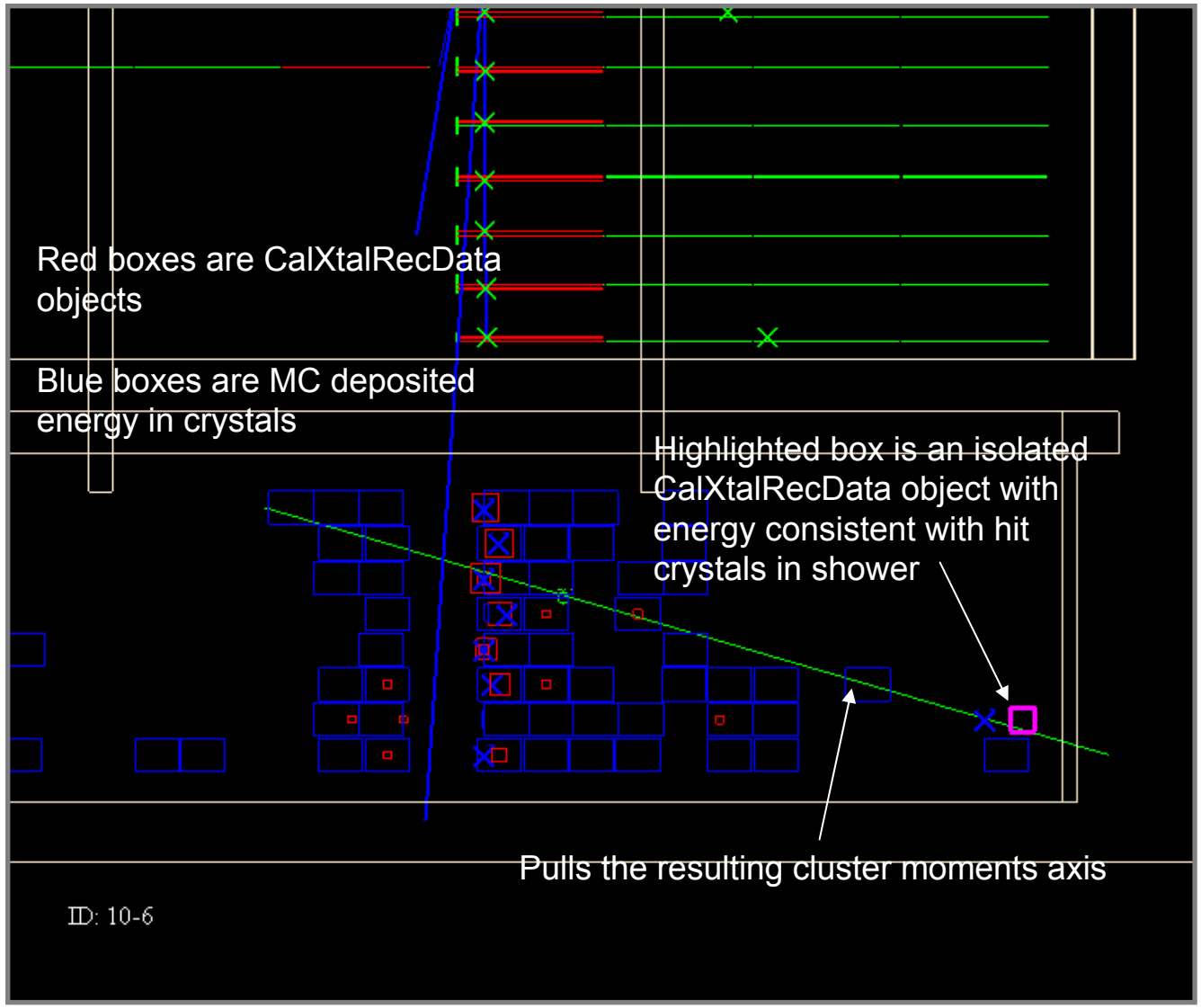


Illustration of Problem w/ Event Display

1 GeV Normal Gammas

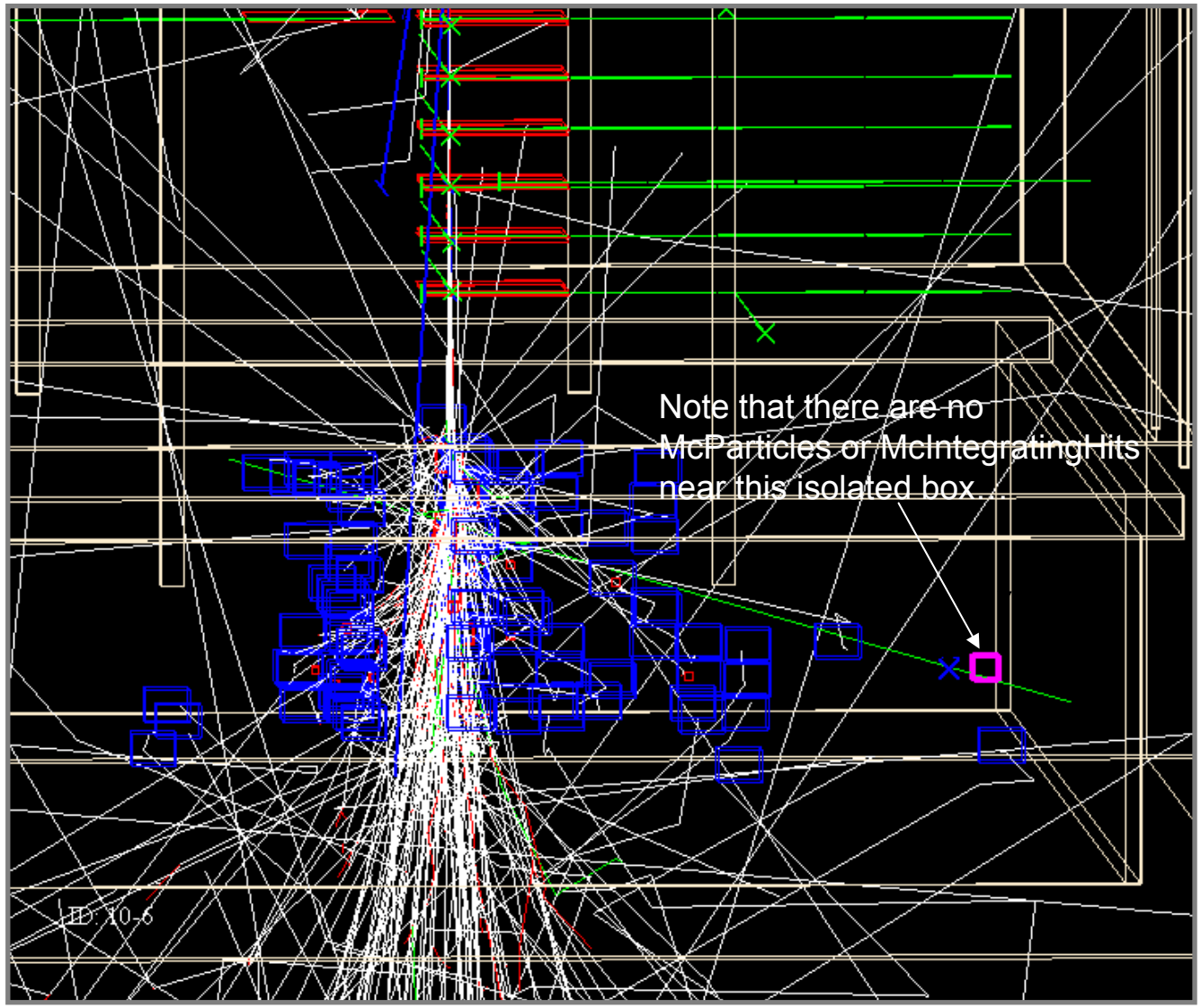
To really see that this crystal hit is isolated, turn back on full MC particle display…

Clearly this hit is “wrong” since it appears that “nothing” created it!

A possible hint?

Also notice that this hit is at the end of the crystal…

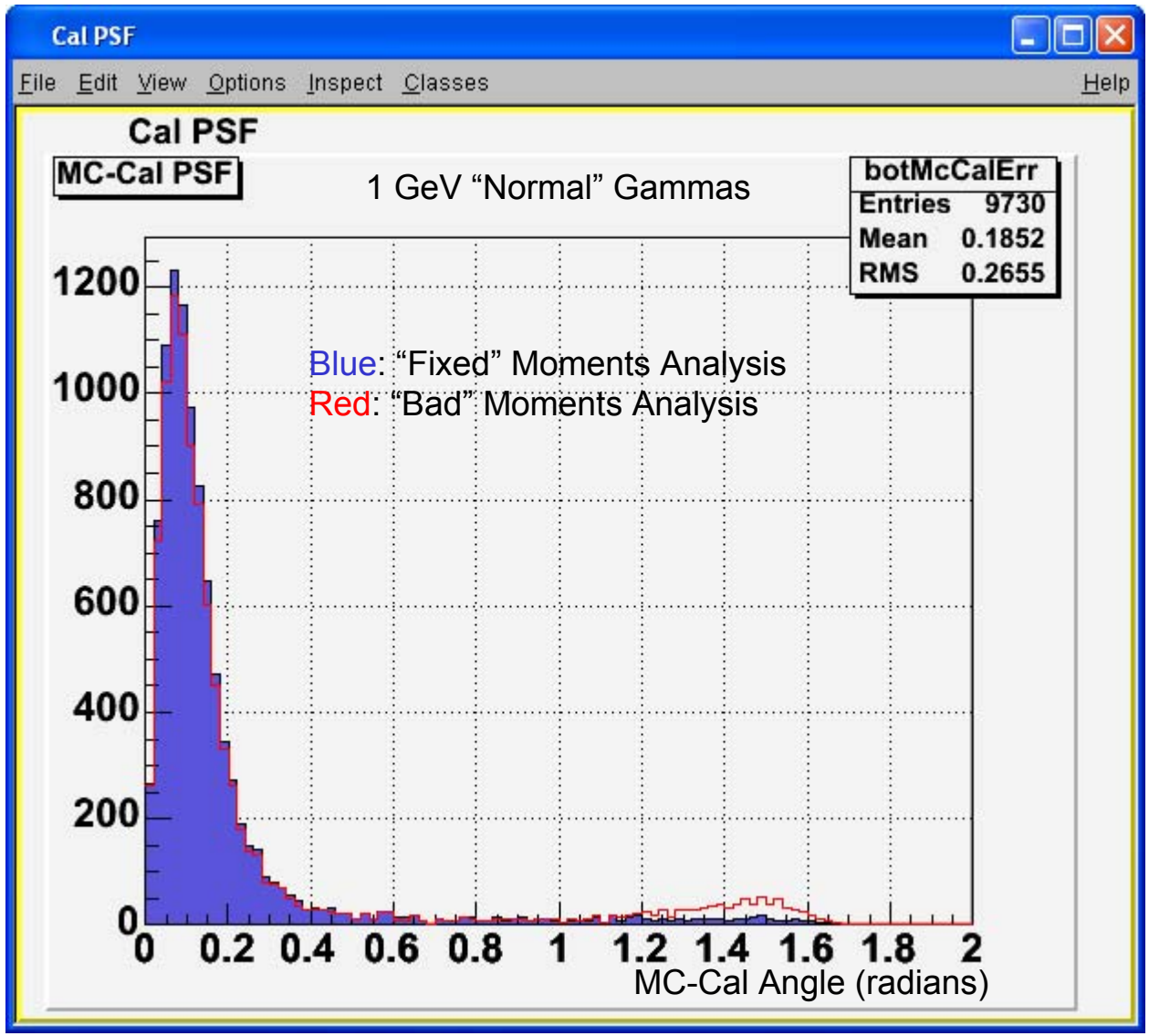
Berrie helps track down the problem: Bug in code which handles direct energy deposit in diodes. Basically, a logical == test is written with only one = (making it an assignment). Result is to always put the energy into the “positive” face of a crystal – always at the opposite end for this category of events!



On Axis Cal PSF with Selection

1 GeV Normal Gammas

Not complete solution to tail problem but does fix the pile up at 90º



Cal PSF vs MC Cos(θ)

AllGamma – Not out of the woods just yet!

Moments Analysis applies an axis signing convention with cos(θ) positive.

At large incoming photon angles it is "easy" to flip this axis (since cos(θ) ~ 0), in some cases the cal axis will be 180° to the incoming photon (so, it "points" in exactly the wrong direction!)

This cannot happen for photons incident normally on the LAT, here the "worst" you can do is get the axis wrong by 90°

Final Cal axis signing needs to be thought about some more…