

What I Did During Summer Vacation



By: Timmy Nelson

Last Wednesday

Recurring controversy:
standalone tracking in outer tracker

- Will it work?
- How many layers would be required?
- Does it require stereo?
- How much does module length matter?
- Do we even need it?

Reconnaissance

- org.lcsim now has good facilities for getting SimTrackerHit information
- org.lcsim has long had a simple circle fitter

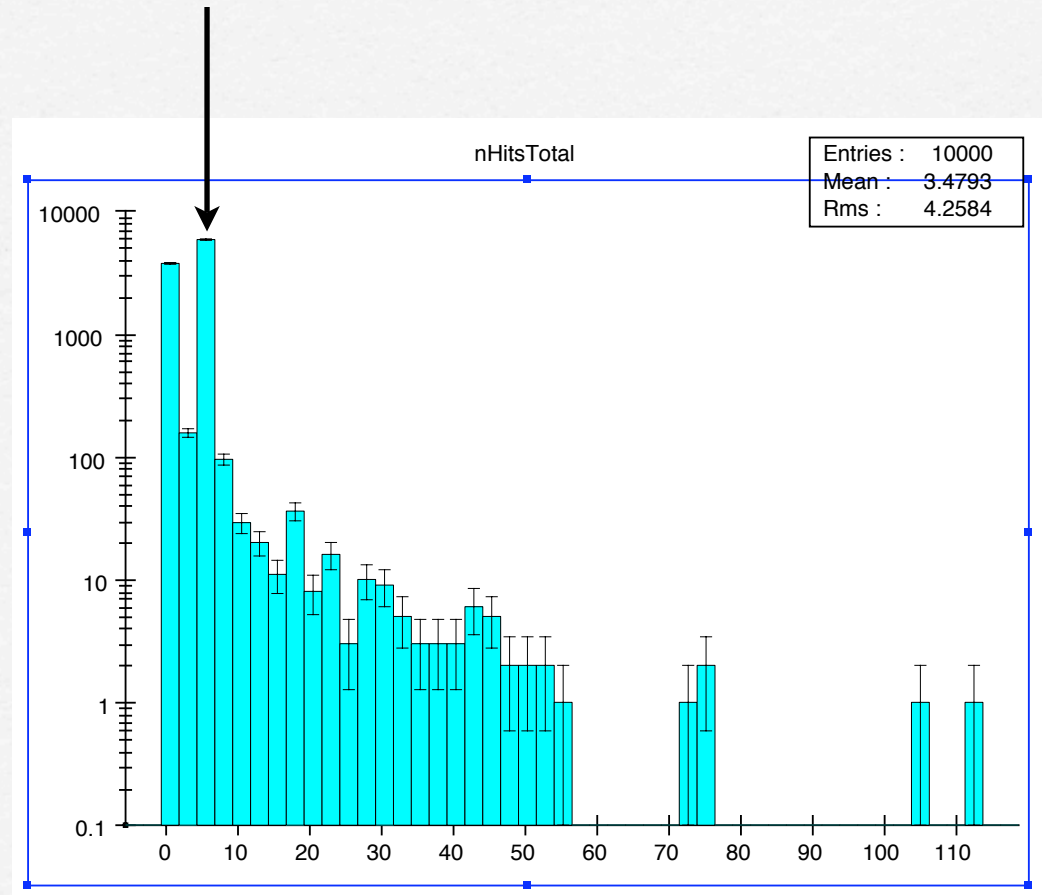
Give it a try in barrel and see what happens...

Standalone Tracking V0.0001

- Take all triads of three layers beginning from outside and walking inward
- Take all combinations of three hits that have no nearby (0.5mm) hits.
- Create circle and require that it passes close to IP (0.5mm).
- Parse remaining layers from outside in and attach hits close to circle that have no nearby hits and refit
- Parse remaining layers again and attach any hits close the circle and refit
- Make chisq cut and call these tracks "found"
- only +/- z modularity

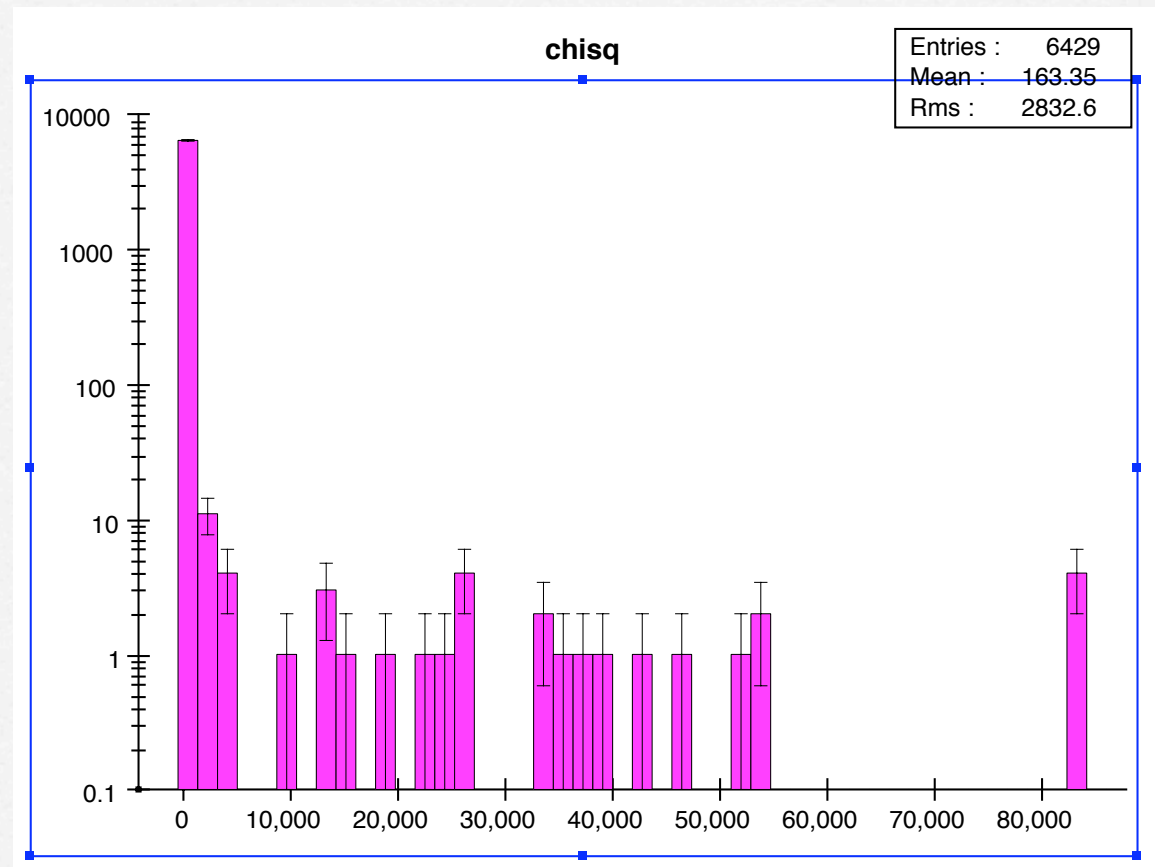
Single Muons (easy)

□ Single muons
with 5 hits in
barrel

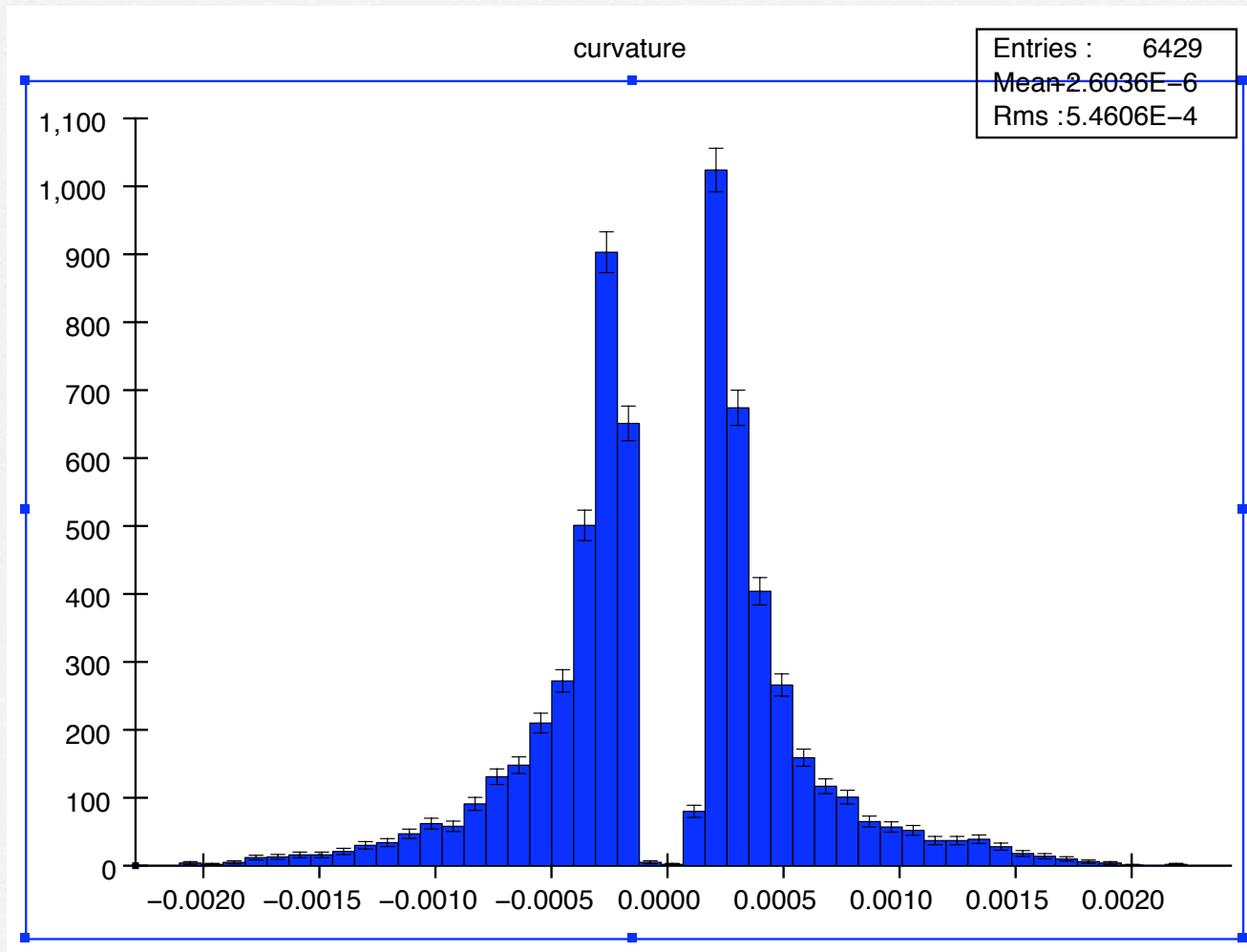


Single Muons (easy)

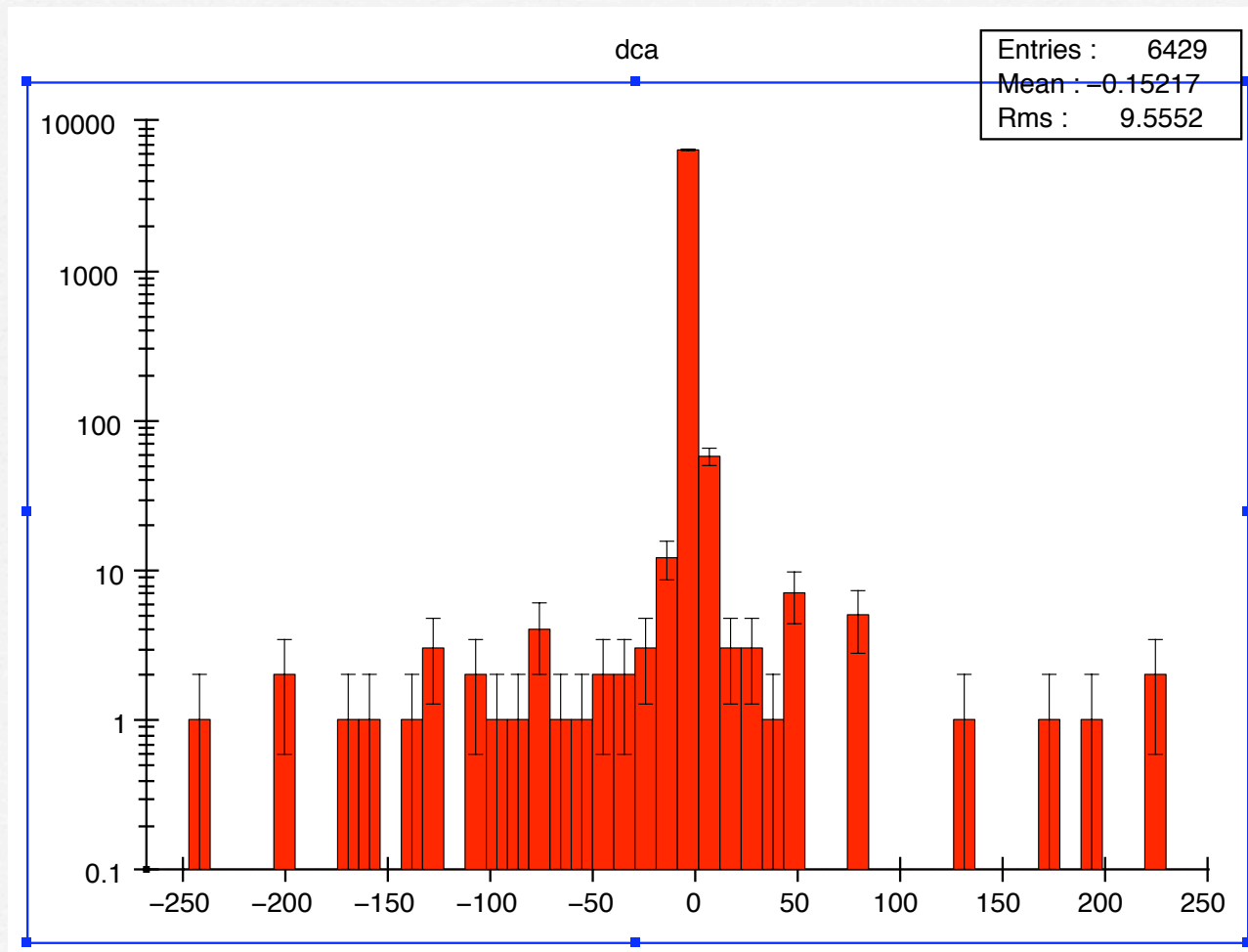
□ Require
 $chisq < 10.0$



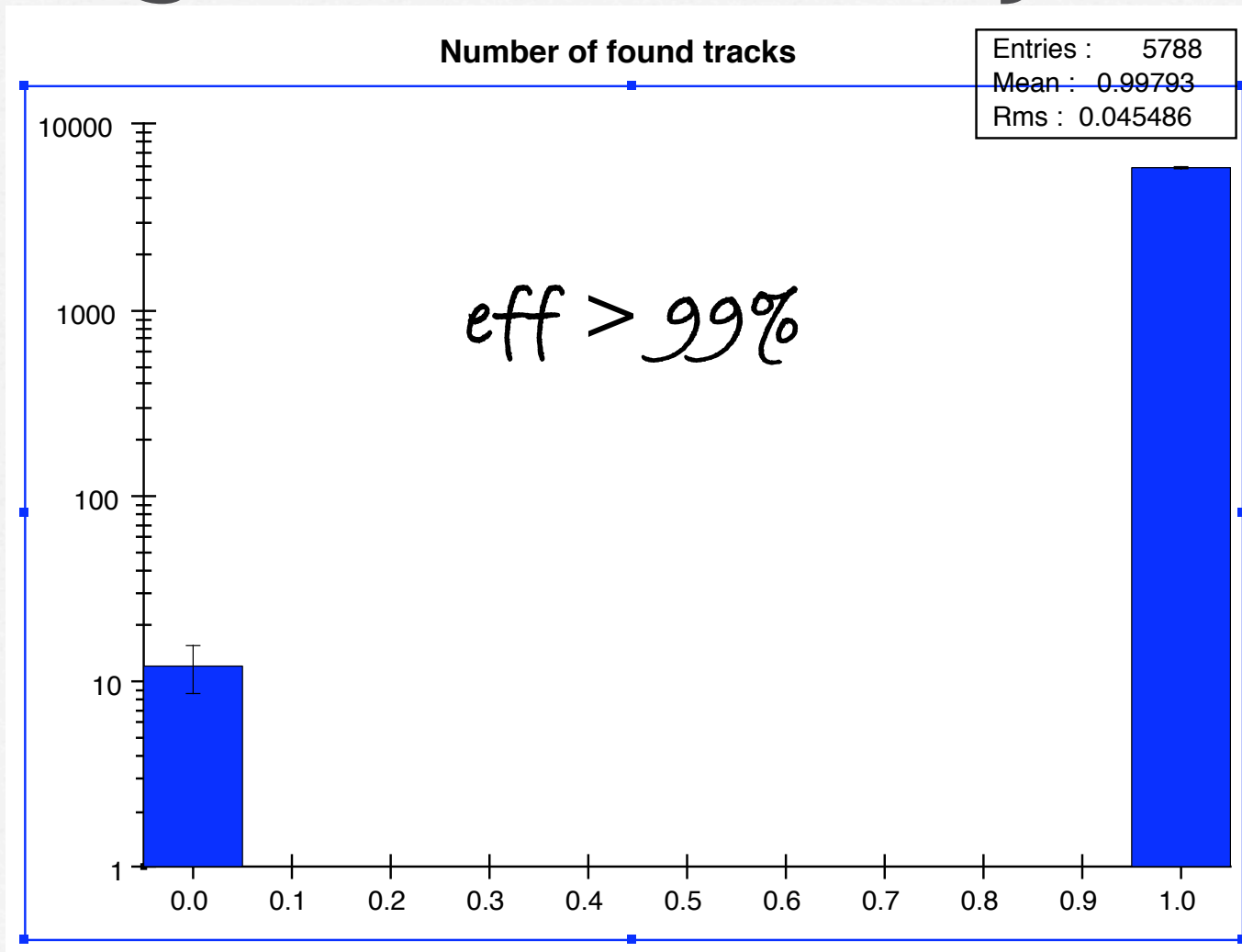
Single Muons (easy)



Single Muons (easy)



Single Muons (easy)



ttbar (hard)

- Expectation (and hope) is that this first attempt picks up only "low-hanging fruit" from busy events: low efficiency but low fake rate
- Good news (?) is that this APPEARS to be true:
 - nfound only about 20% of what is in ttbar event.
 - do not have capability yet to show that these tracks are "good"
- Clear sign of a bug in ttbar events... could be major

Next

- So far about 2 days spent on this. Worth a few more to fix obvious bugs and get results.
- Put focus back on silicon simulation and digitization required to make such studies reasonably realistic.