CORNELL UNIVERSITY LEPP
LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS

Latest Submission to SiStripElectronProducer and the State of Pixelless Electron-Finding

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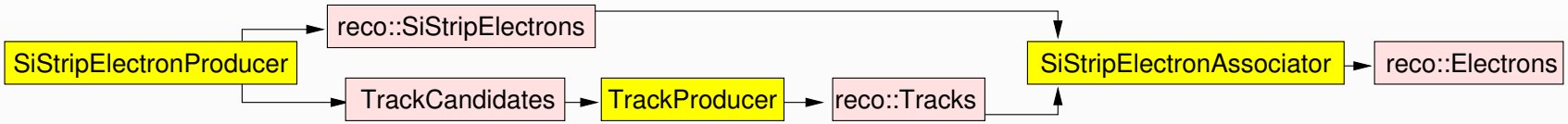
Current Status:

- Complete structure for pixelless electron-finding is in place (in August 4's nightly and maybe `CMSSW_0_9_0_pre3`)
  - Match SiStrip hits to SuperCluster
  - Drop hits with bad χ^2
  - Seed track-fitting
  - Fit tracks
  - Associate fitted tracks with electron seeds
  - Make high-level reco::Electron objects
- Tracking efficiency problem mostly solved (3% $\longrightarrow$ 75%)
- Hit-matching algorithm (the interesting part) remains simplistic

Structure of the Latest Code



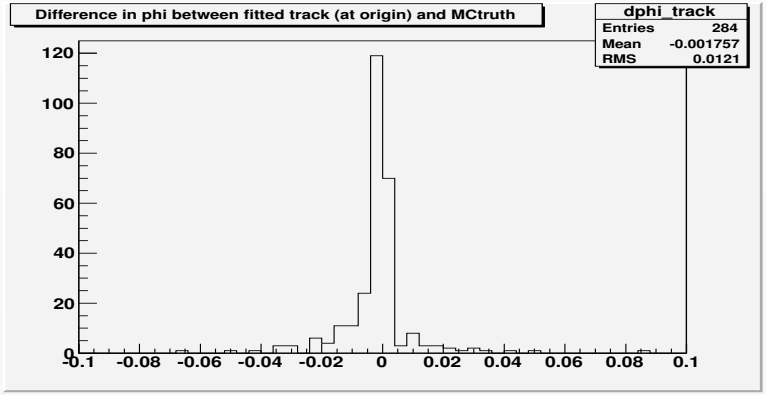
SiStripElectronProducer matches SiStrip hits to SuperClusters, drops hits with bad χ^2, creates SiStripElectrons and TrackCandidates

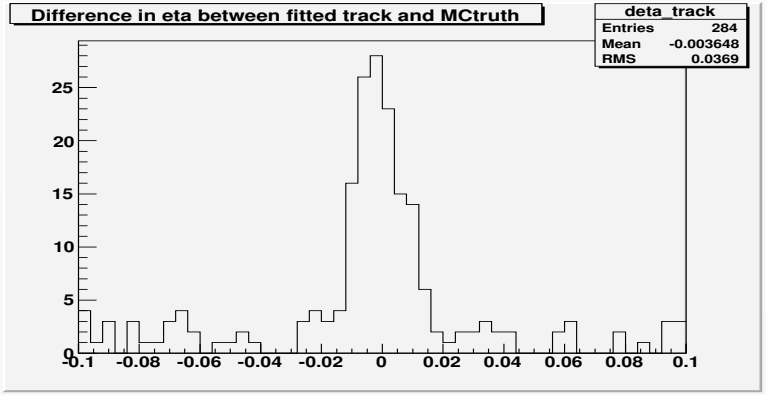
reco::SiStripElectron is a reco::Candidate containing references to SuperCluster and hits, as well as diagnostic information about the hit-matching

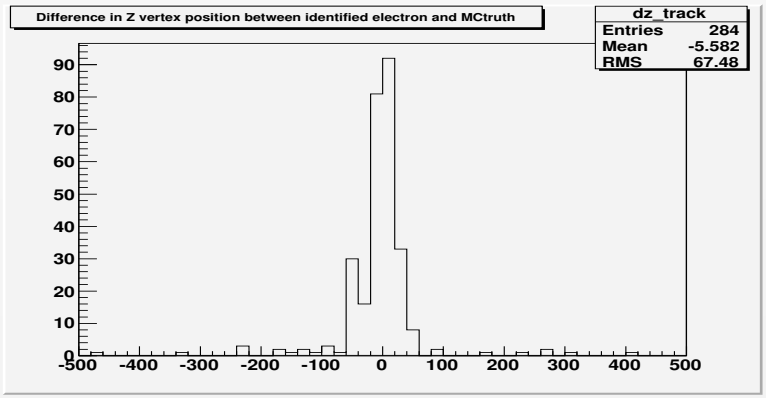
SiStripElectronAssociator associates reconstructed Tracks with the electrons that seeded them, outputs high-level reco::Electrons

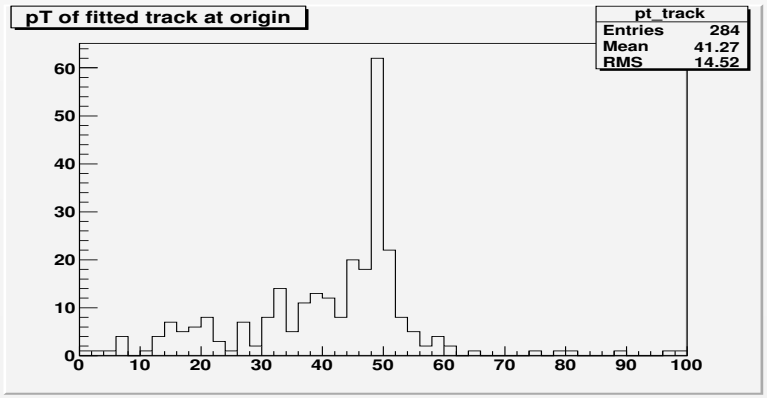
Tracking Efficiency

- Sorting hits radially brought efficiency up from 3% to 75%
- Dropping hits with bad χ^2 should also help (untested)

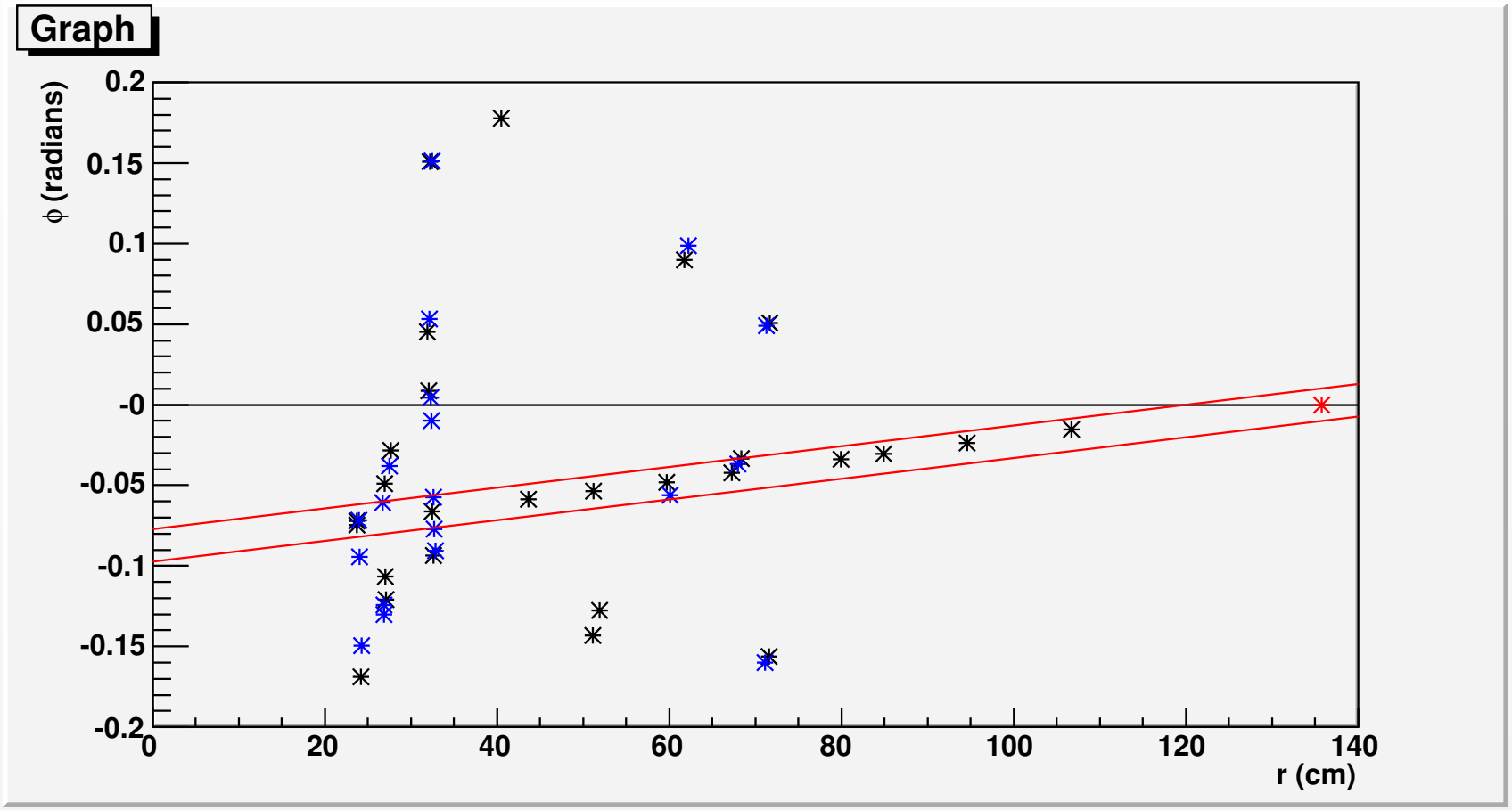








Hit-Matching is still the Band Algorithm



. . . though we now throw out hits with $\chi^2_i > 10$

The look of things to come

- I'm leaving Cornell (going to Texas A&M to do $\tau^{\pm}$ reconstruction)
- Jean is taking over this project
  - He's been involved all along
  - Already getting data from ElectronAnalyzer to FWLite
  - He will focus on hit-matching algorithms (the physics)
  - He'd be giving here, giving this talk, if it were not for a sudden emergency
- Expect revisions in SiStripElectronProducer's choice of hits (to improve electron identification and tracking efficiency), but only bug-fixes in the rest of the infrastructure