Stand-Alone Tracking with the SVX

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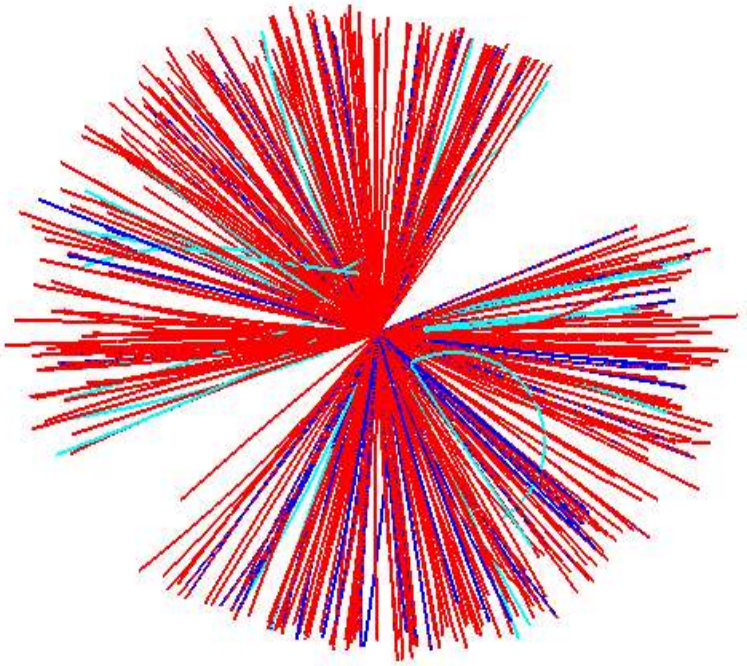
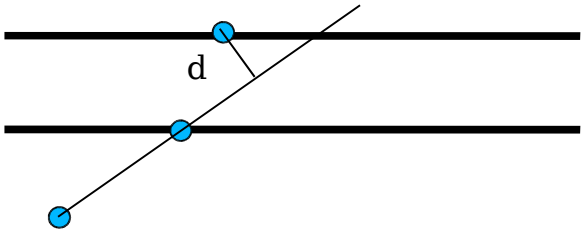


Status

- Using Ghits due to some odd features of Clusters – looking into it
- Can find z_vertex about as accurate as one could hope for – sigma ~ 15 micron
- Can find x-y_vertex not as well as z_vertex – probably due to track curvature
- p_T resolution ~ 20%
- High p_T efficiency > 90%

The Algorithm

- Minimize Summed-Gaussian-Widths function to find the vertex

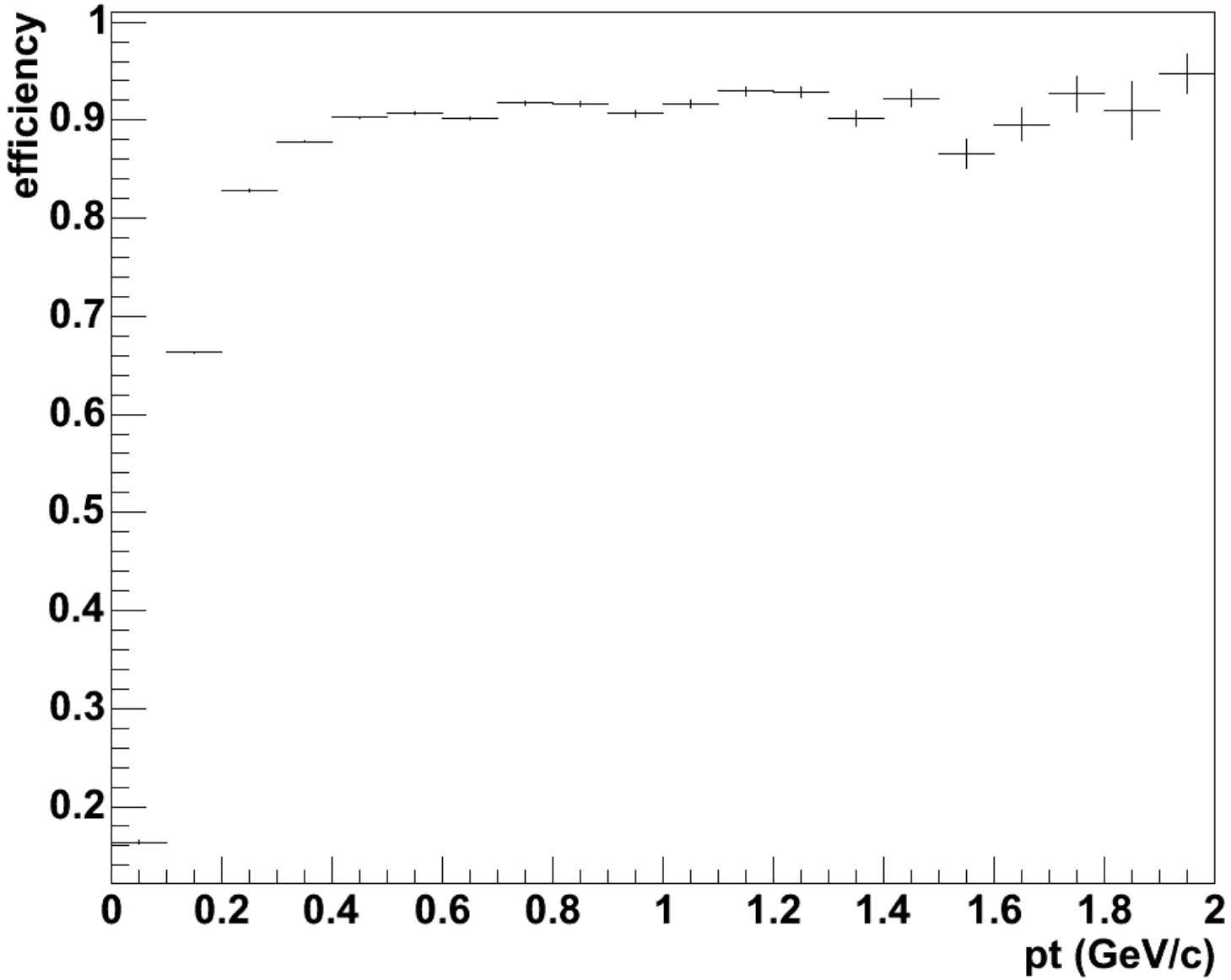


$$S(x_v, y_v, z_v) = -\sum_i \exp\left(-\left(\frac{d_i}{2\sigma}\right)^2\right)$$

- Take vertex and two (reasonably selected) hits in the inner layers. Try to fit a helix through the 3 points. If helix fits, then fit the helix to outer layers. If helix still fits, we have a candidate.
- Take hits from each of the inner layers and one outer layer, and repeat above to get secondary candidates. Make a dca cut on the candidates to only select tracks with a partner.

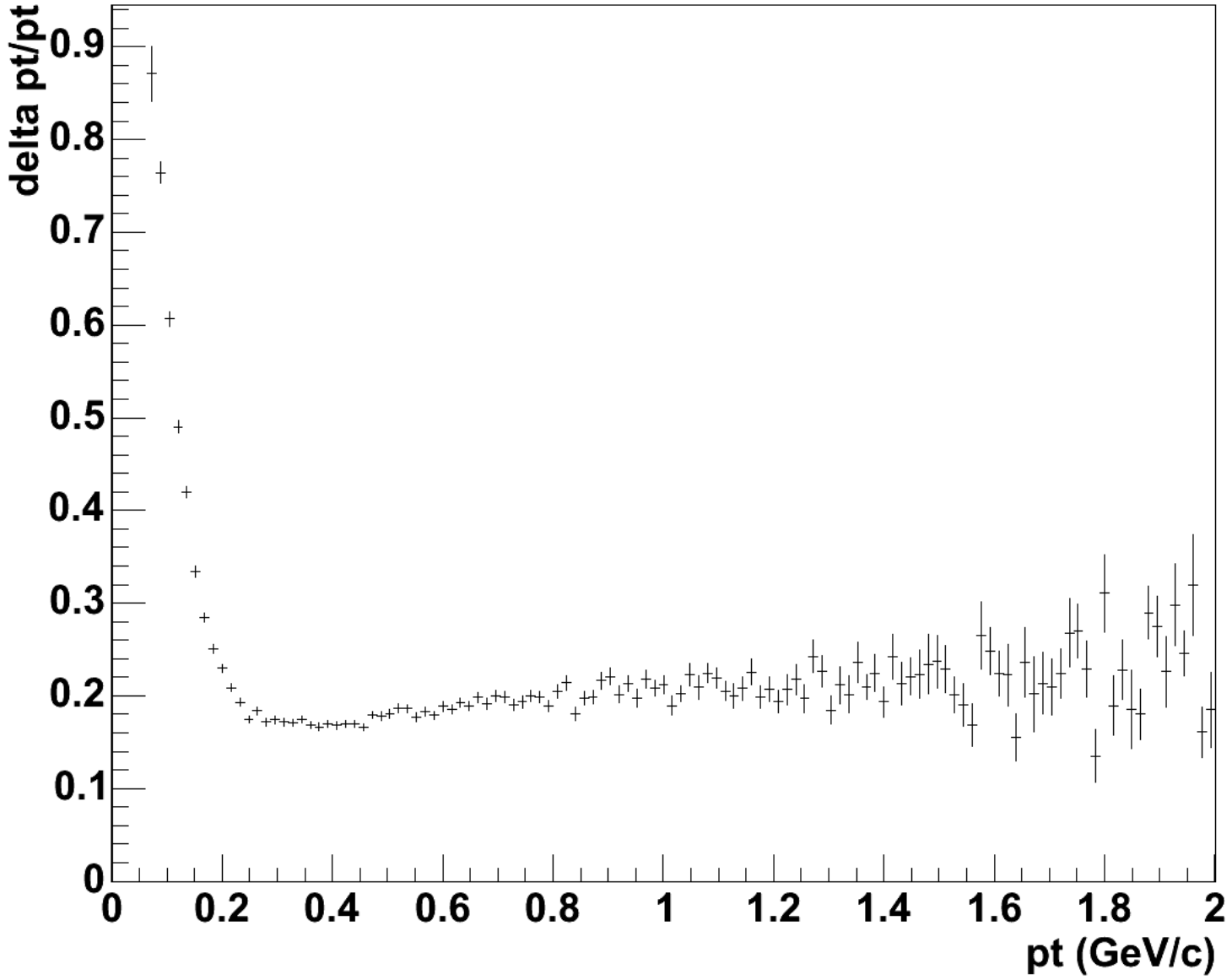
Reconstruction Efficiency

Reconstructed primary tracks – the errors are event-by-event standard deviations, weighted by multiplicity

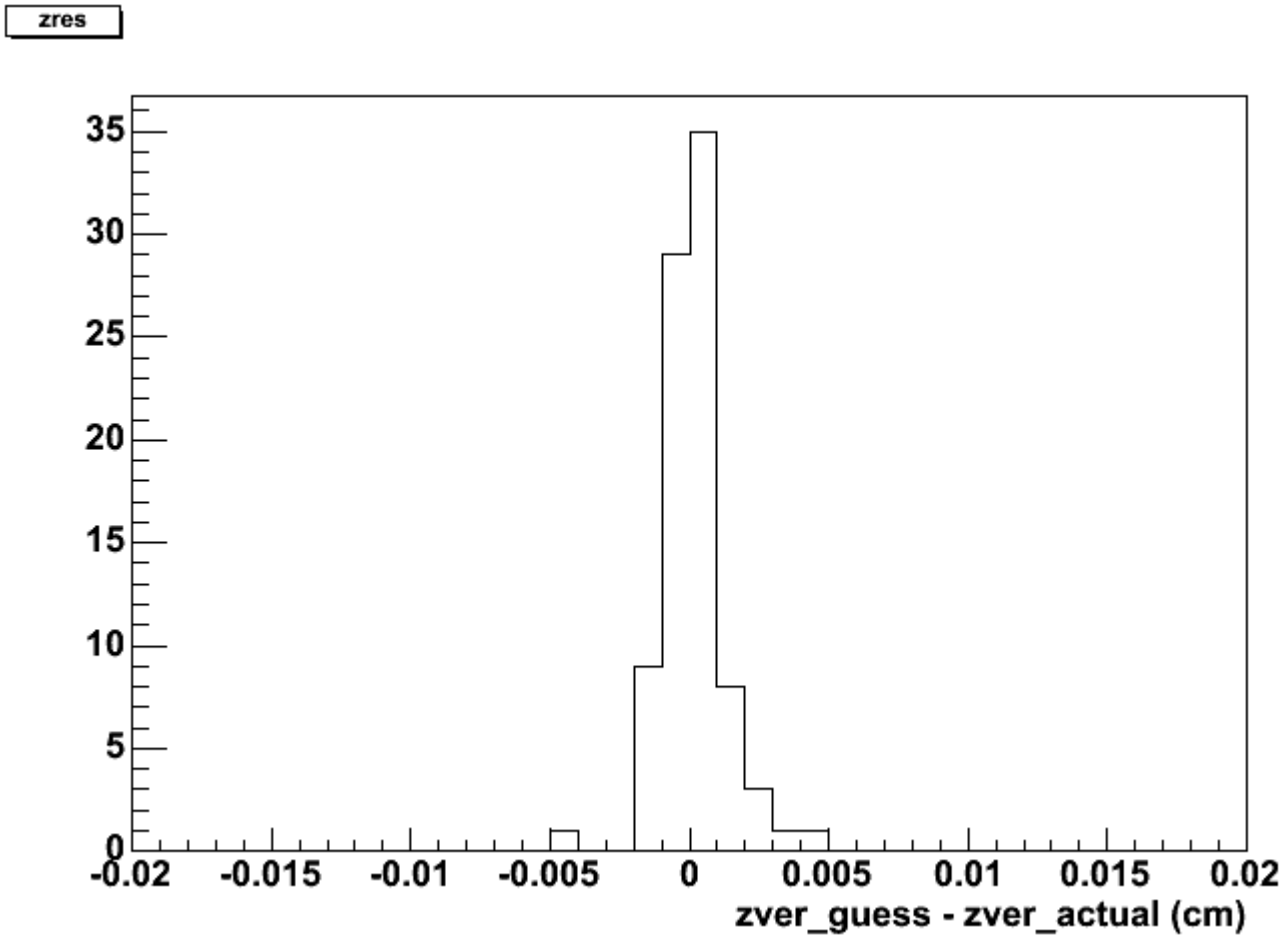


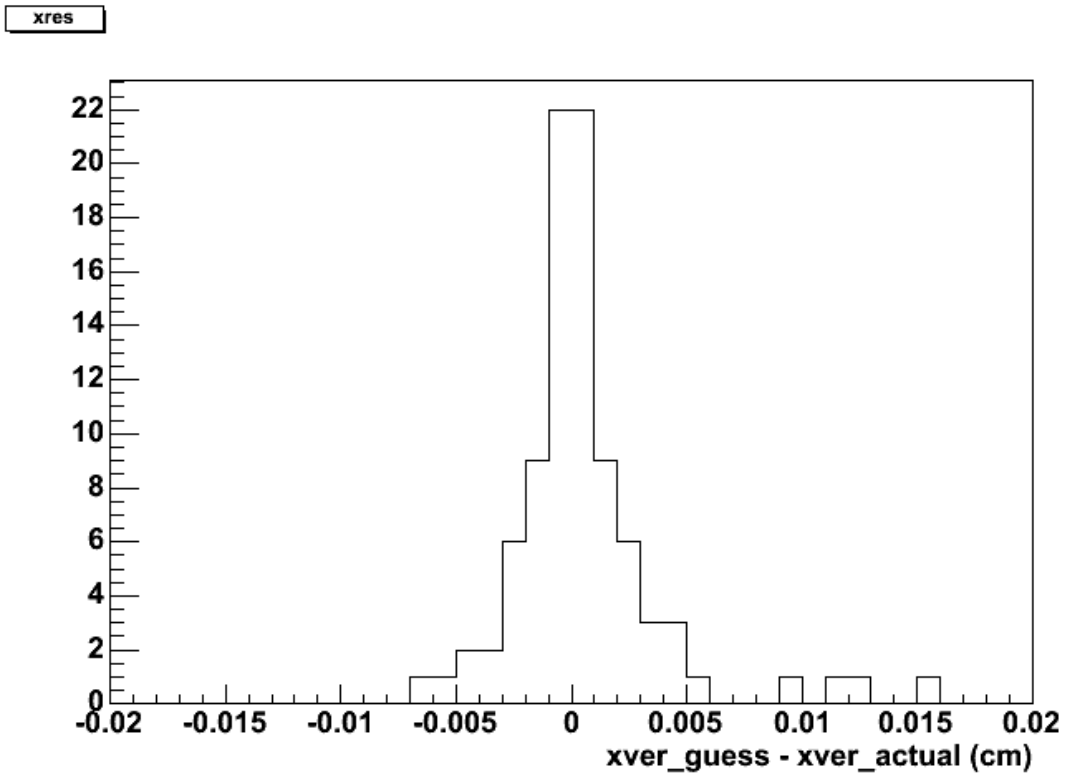
Pt Resolution

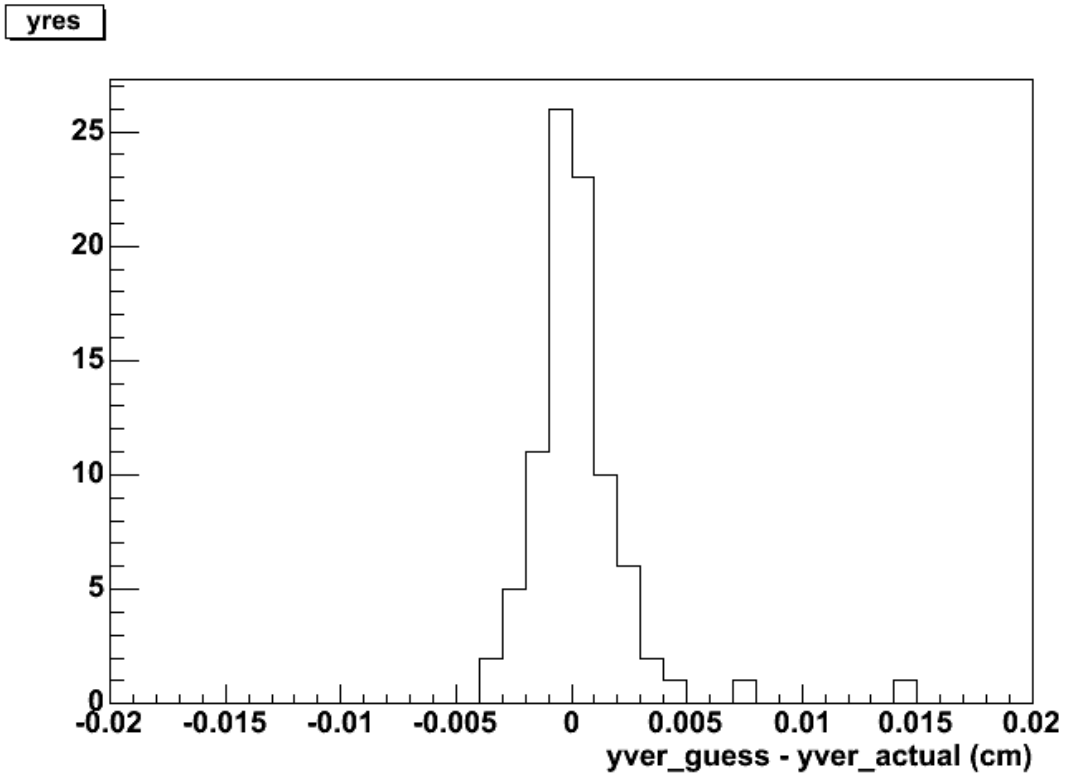
Mean value of $\Delta p_T/p_T$



Vertex Resolution

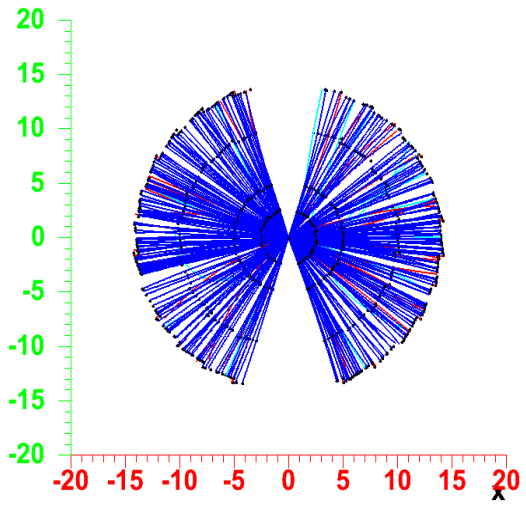



xres
22
20
18
16
14
12
10
8
6
4
2
0
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
xver_guess - xver_actual (cm)

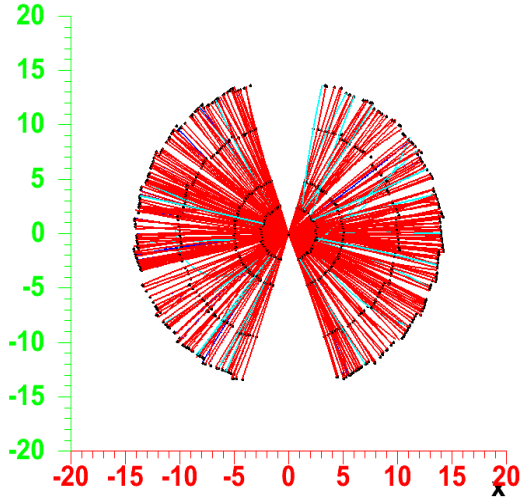

yres
25
20
15
10
5
0
-0.02
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
0.02
yver_guess - yver_actual (cm)

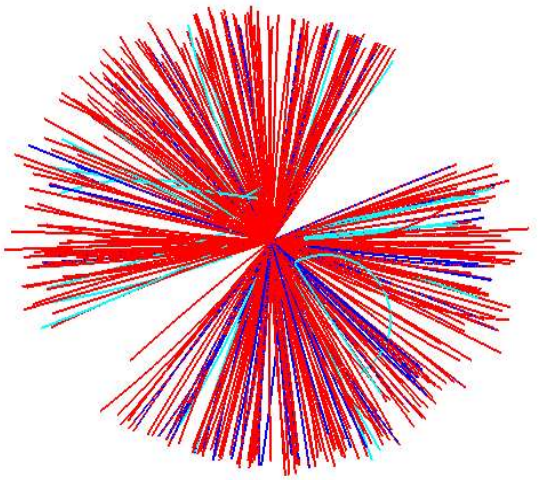
Event Display

Dark Blue=reconstructed track
Red=real primary track
Light Blue=real secondary track



TPad





OpenGL