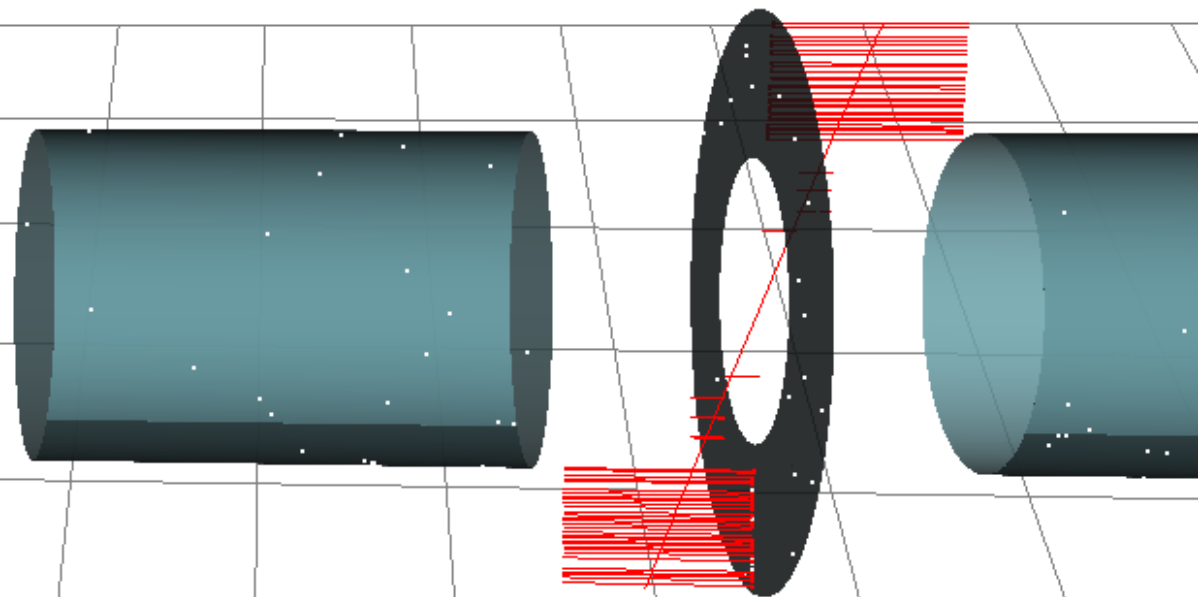


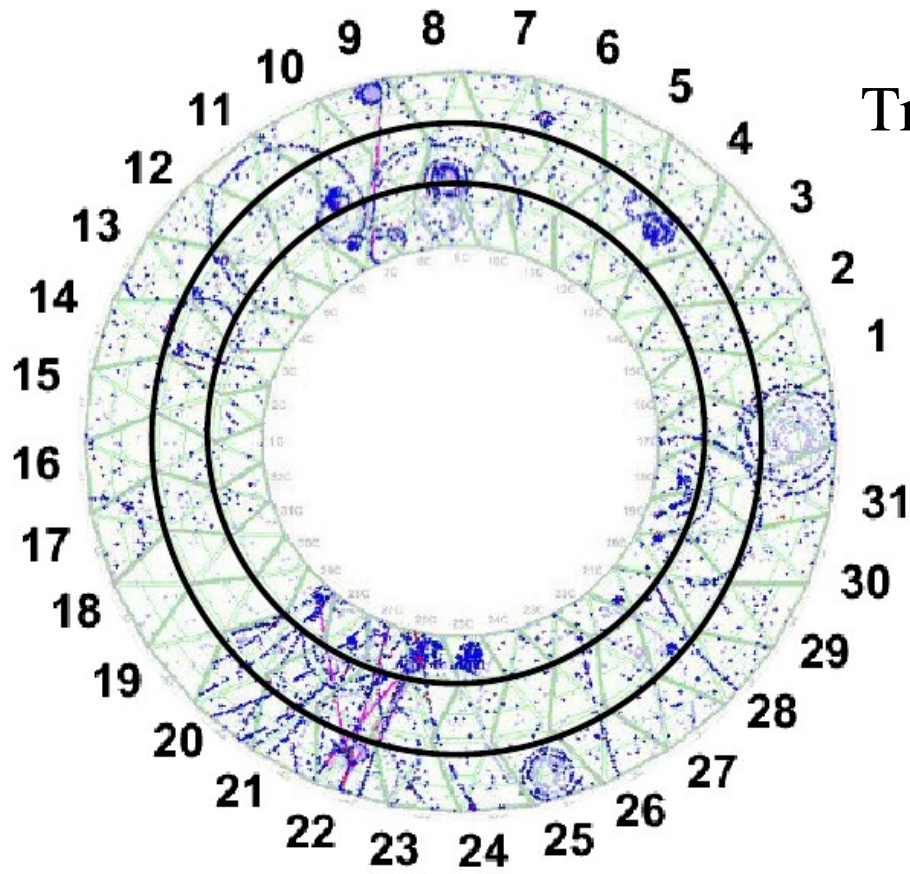
TRT L2 Alignment w/ combined tracks (InDetAlign-REPC-01)

John Alison
Andrea Bocci



TRT L2 Alignment

Modules in the TRT Barrel (both A and C side together) are aligned in 3 DoF
2 translations + rotations around global- Z



Tracks Selection:

- > 45 TRT hits

- > 2 GeV

Reconstruction in rel 15 (tag=15.0.0)

Using Si alignment InDetAlign-REPC-01

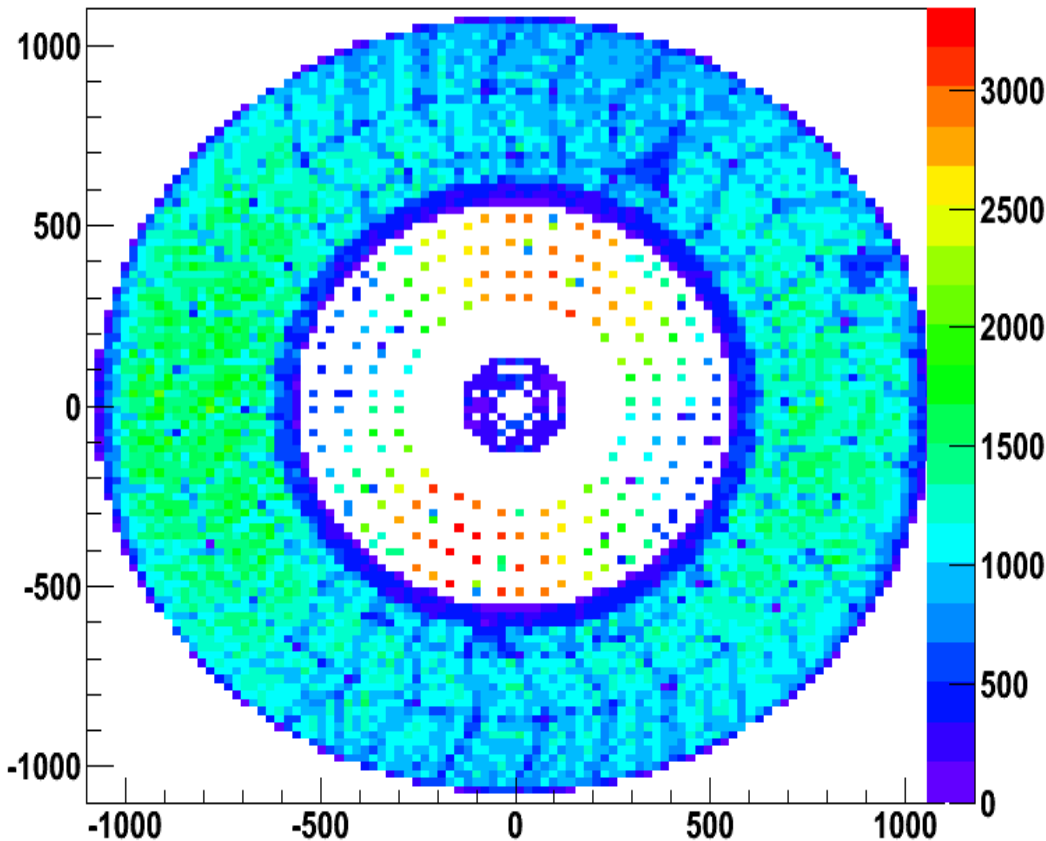


L2 Alignment with combined tracks

- Convergence after 5 iterations.
- Number of hits/tracks increased with alignment

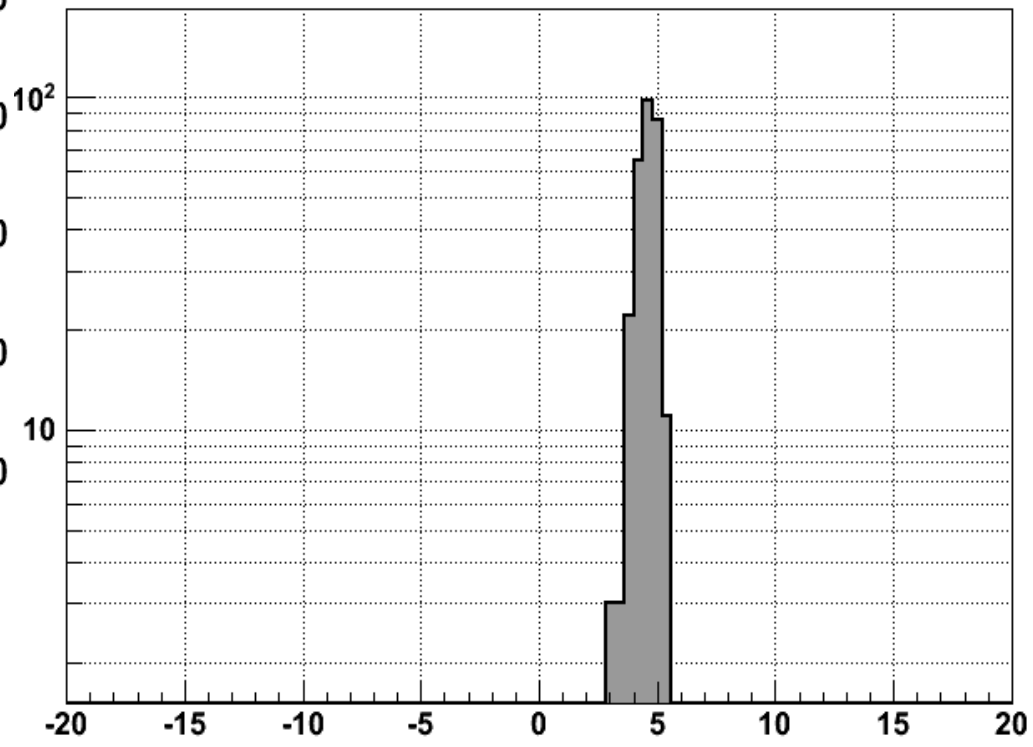
Hits used in the alignment

Hit Map for Barrel



Unconstrained global DoF removed by fixed Si

Eigen value spectrum



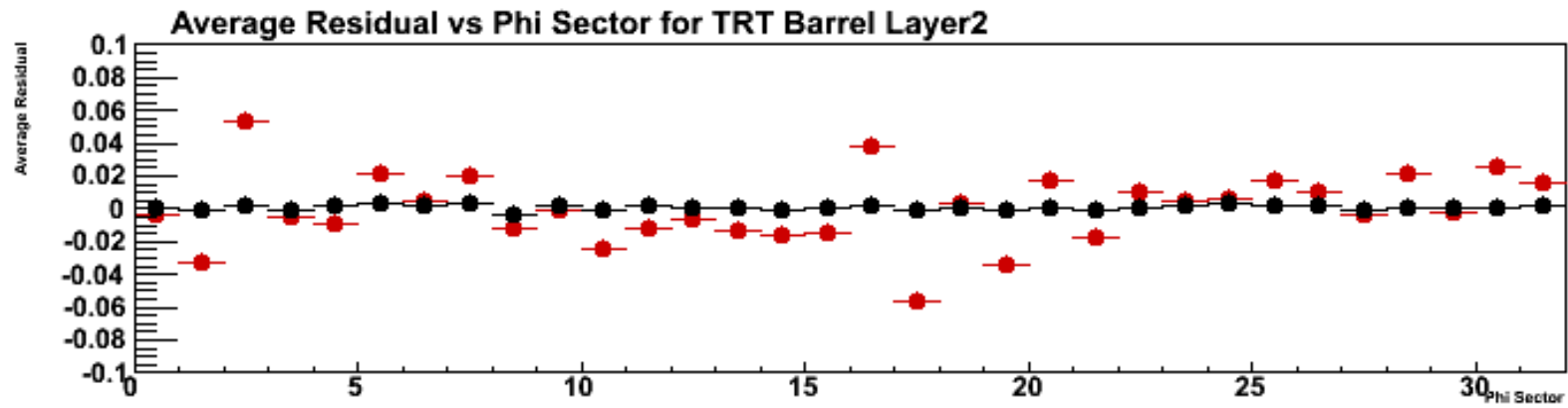
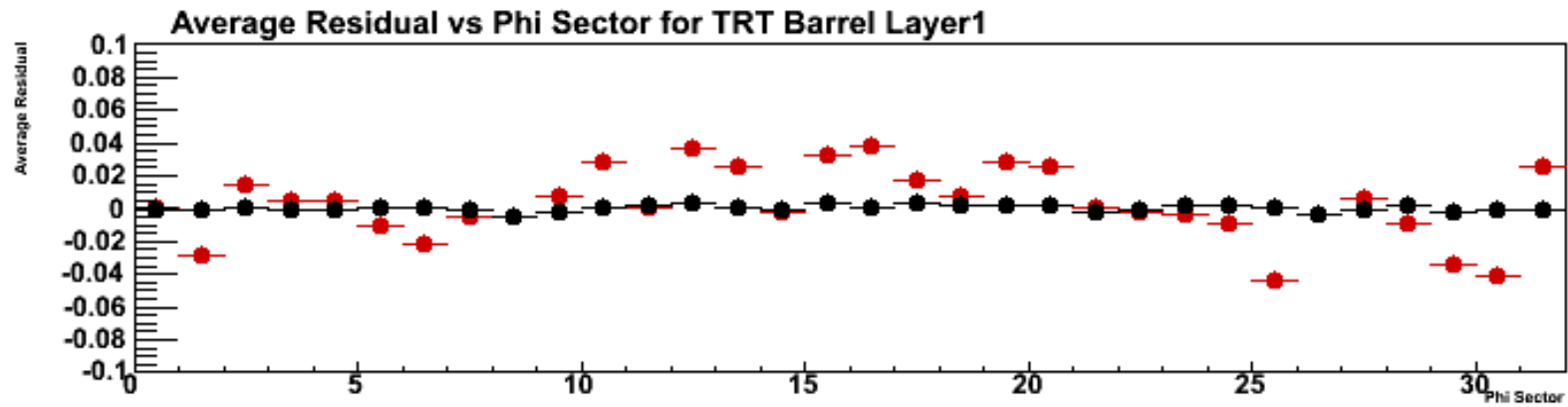
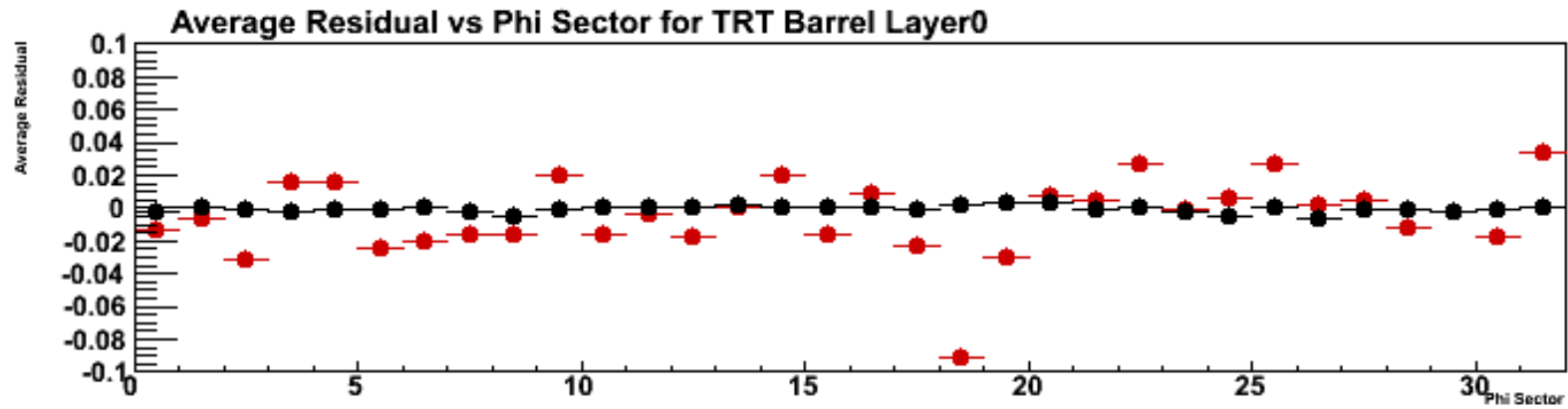


Track Selection for following plots
> 45 TRT hits
TRT-Only CTB Tracks

Before L2
After L2

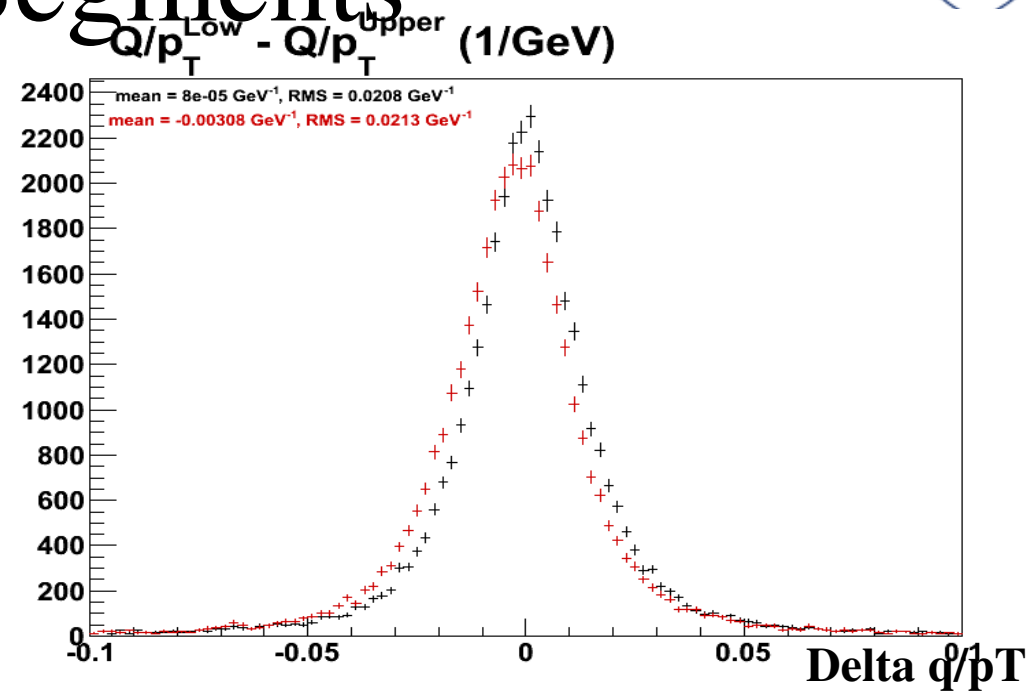
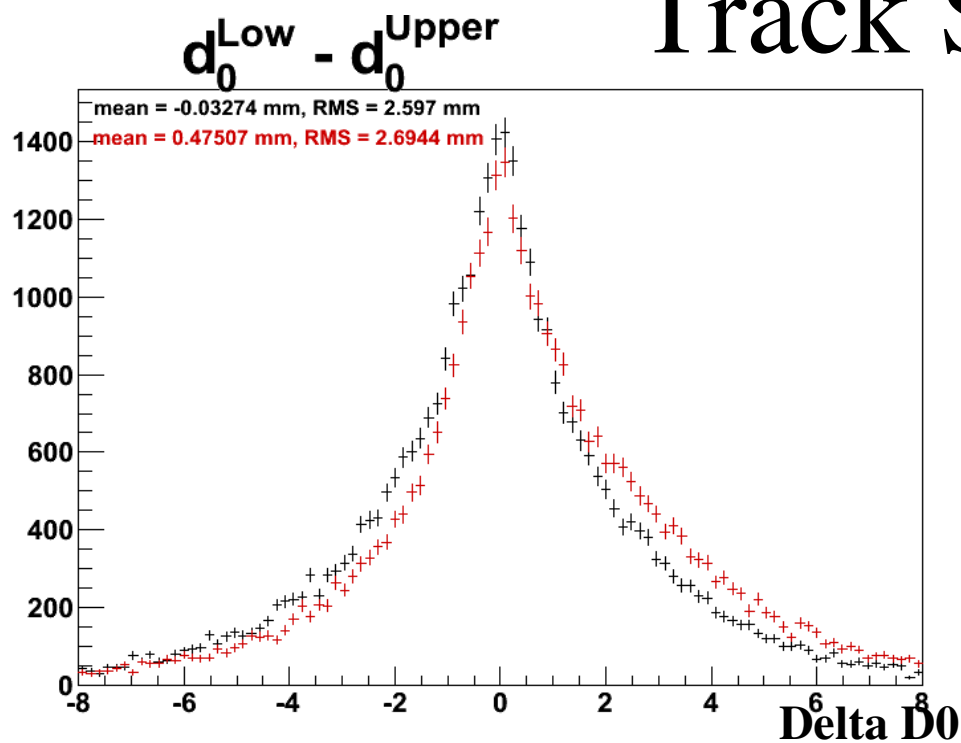


TRT Residuals

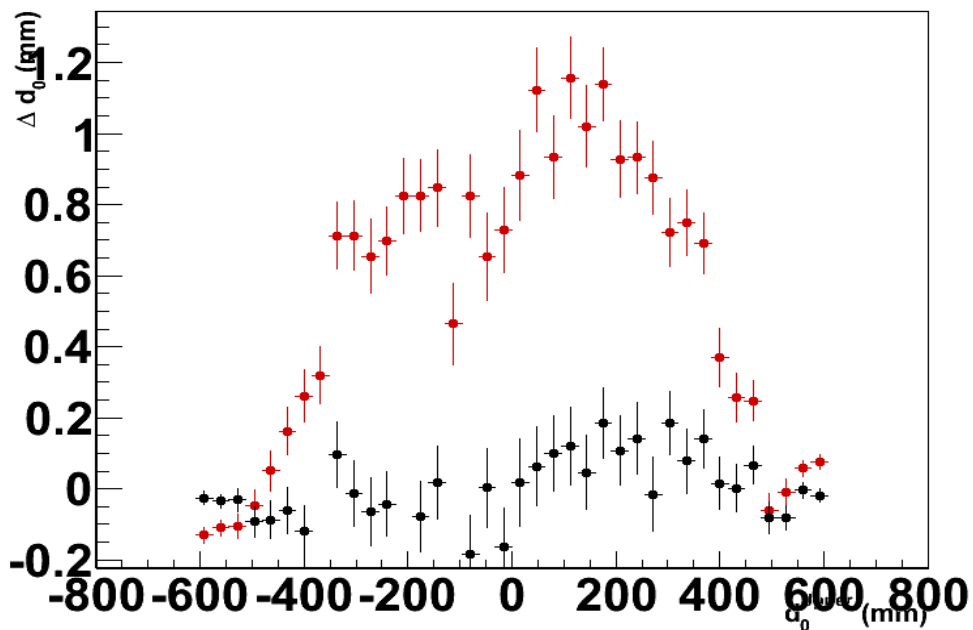




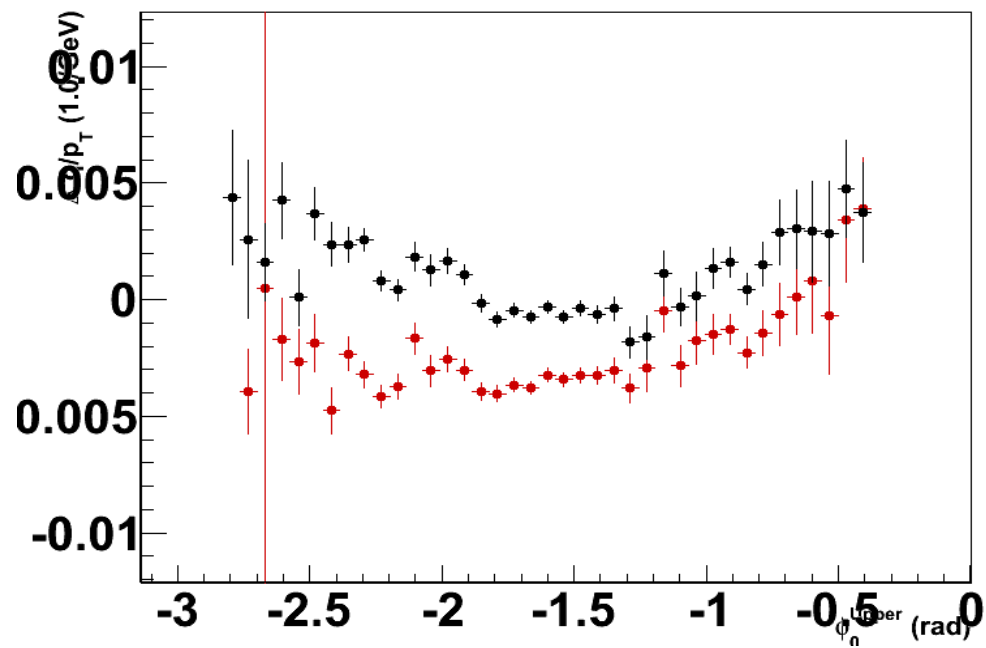
Track Segments



average_delta_d0VsD0



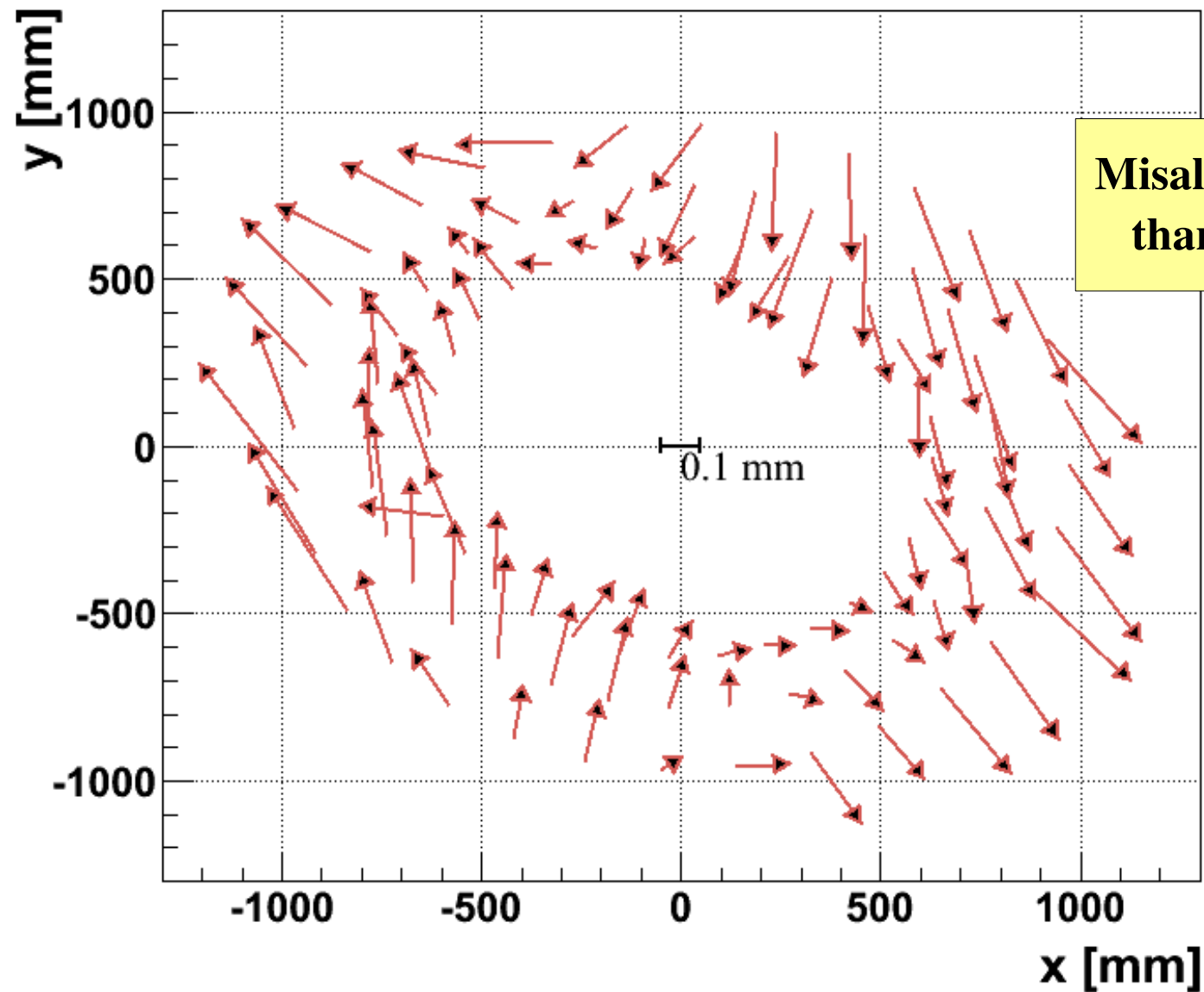
average_delta_qOverPtVsPhi0



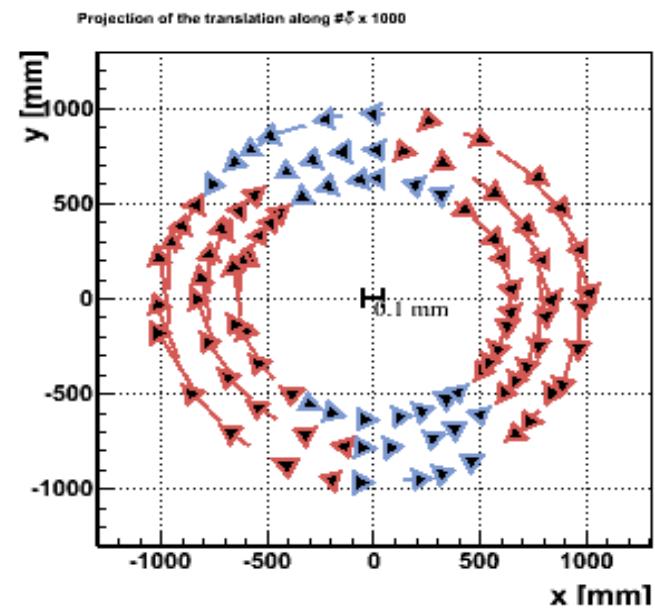


Measured Misalignment

translation x1000 - Layer 2



Misalignment seen here is different than that with TRT Only tracks





Track Selection for following plots

Combined tracks:

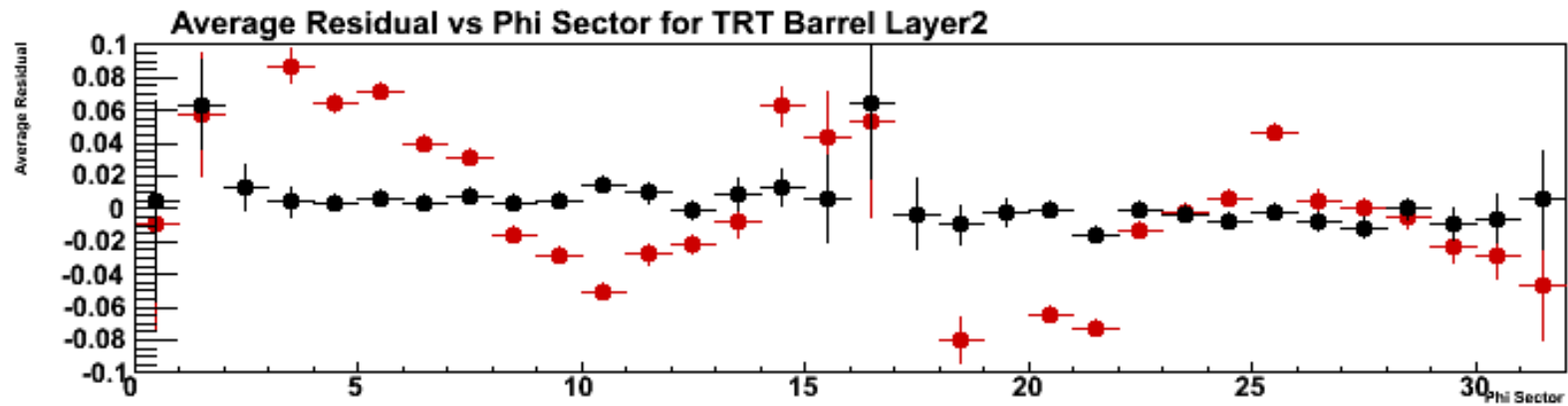
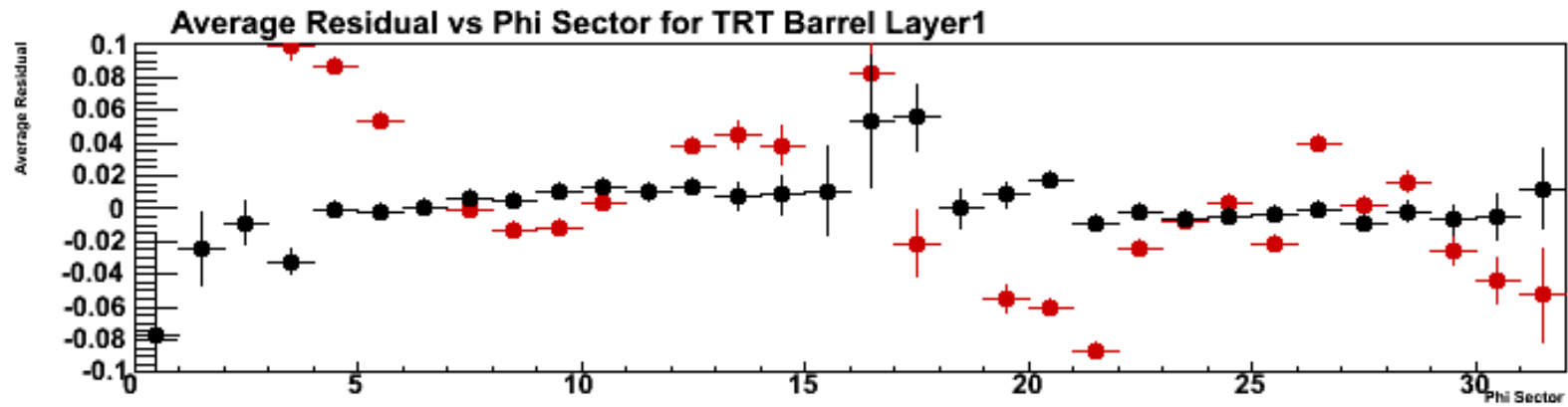
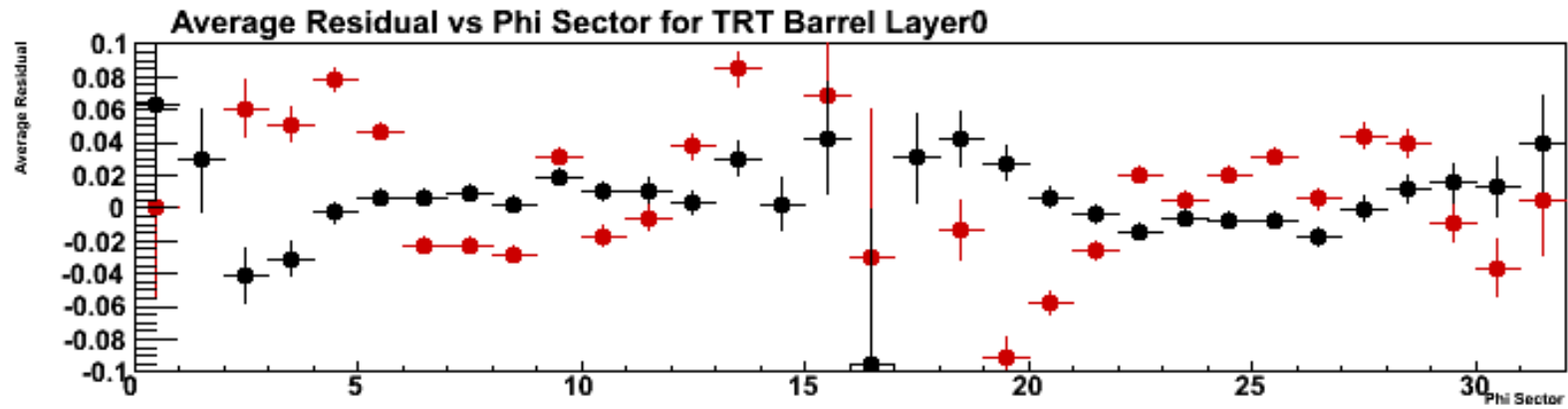
> 45 TRT hits, > 9 SCT hits, > 2 Pix hits
>2 GeV

Before L2

After L2



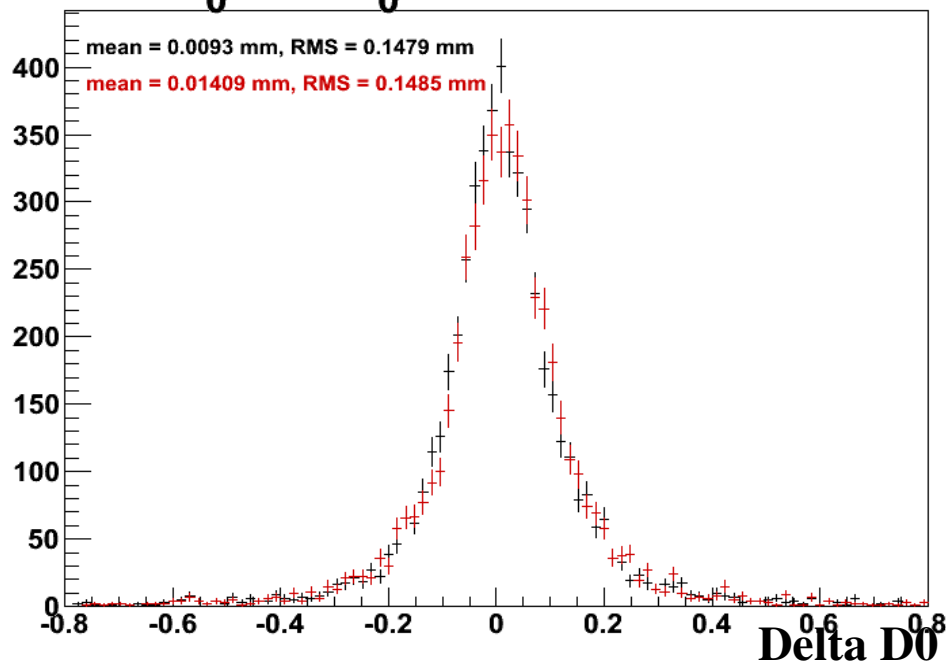
TRT Residuals





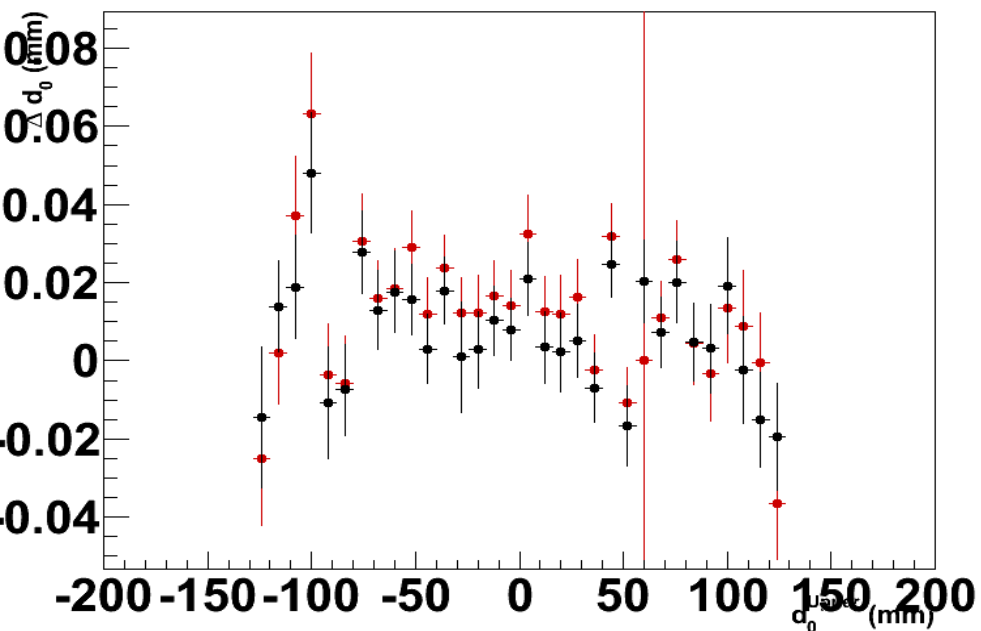
Track Segments

$$d_0^{\text{Low}} - d_0^{\text{Upper}}$$

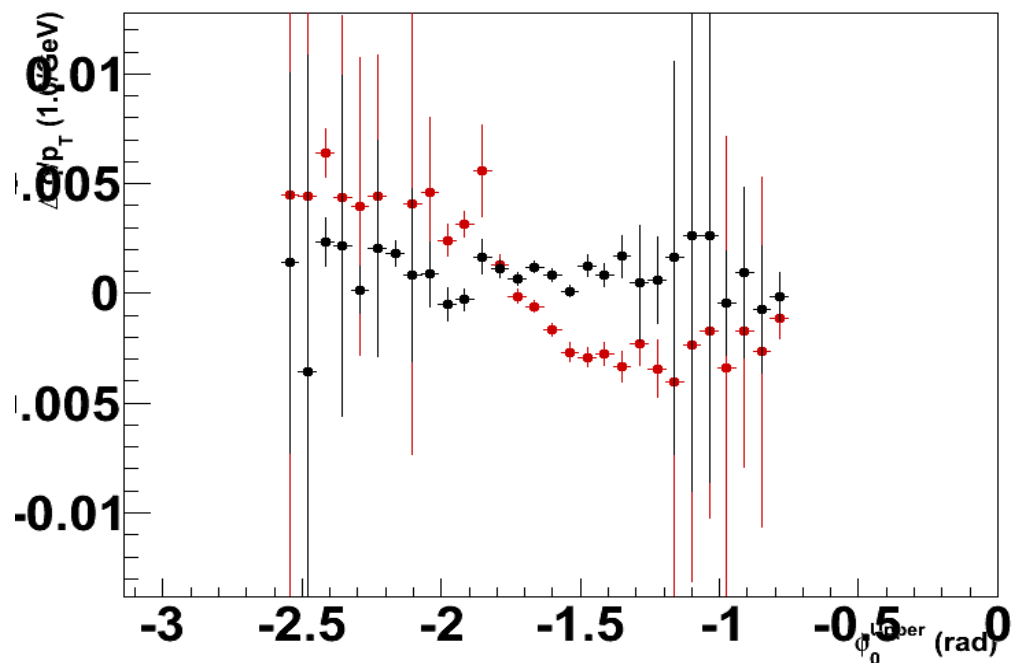


Delta q/pT

average_delta_d0VsD0



average_delta_qOverPtVsPhi0





Conclusions

- A lot more to do!
- Validation looks very similar to TRT Only L2 alignment but constants significantly different

L2 alignment presented here is not yet in db.



Bonus



Average Residual vs Phi Sector

A-Side

C-Side

