

# Run7 PC3 Matching Recalibration

W. G. Holzmann



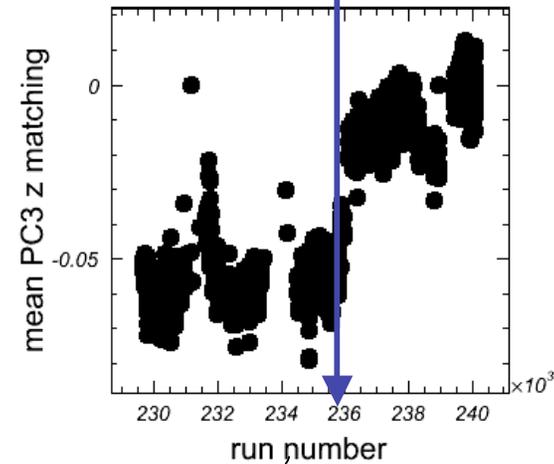
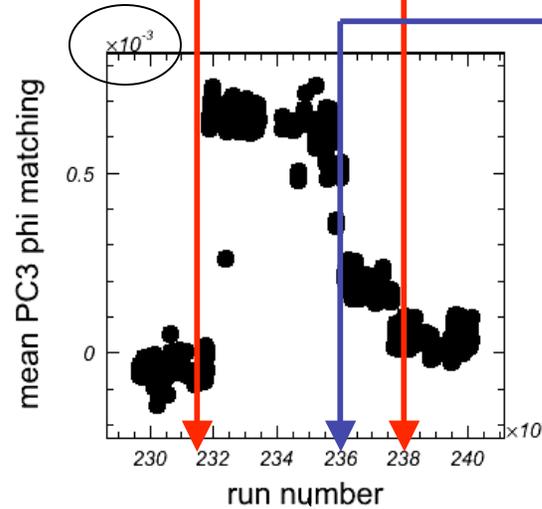
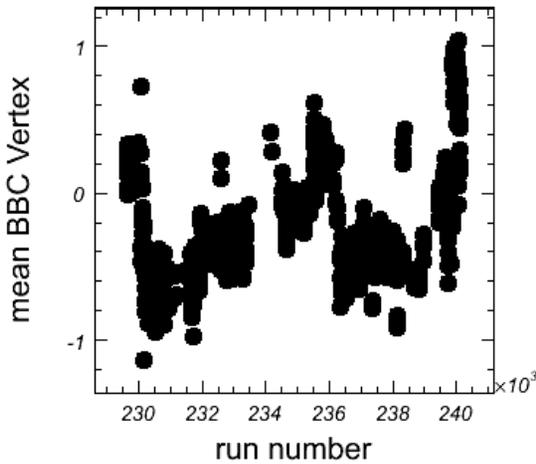


# Run7 : Basic global and charged track CWG QA

~231776 PC3E  
FEM problems  
started

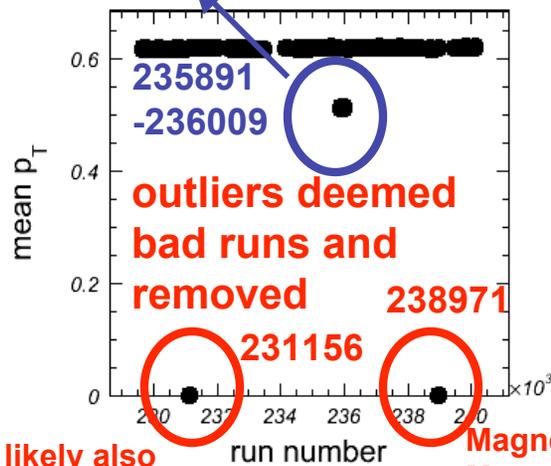
~237717 PC3E  
FEM swapped

~236131 switch from “+” to “-”  
configuration for magnetic field



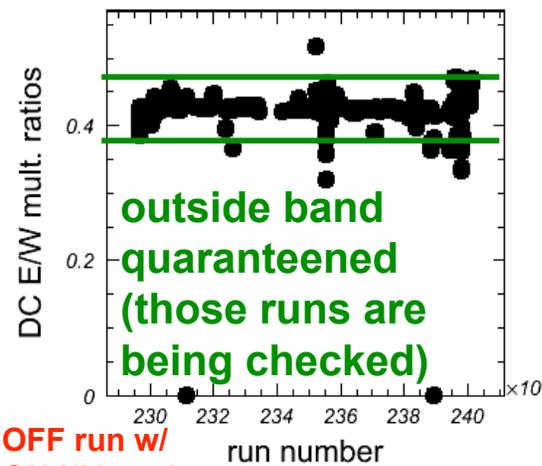
raw, uncorrected matching residuals

++magnetic field



likely also  
field OFF run

Magnet OFF run w/  
Magnet ON HV setting



Also excluding  
converter runs,  
although they  
mostly pass QA :-)



## Run7 : Run Groups

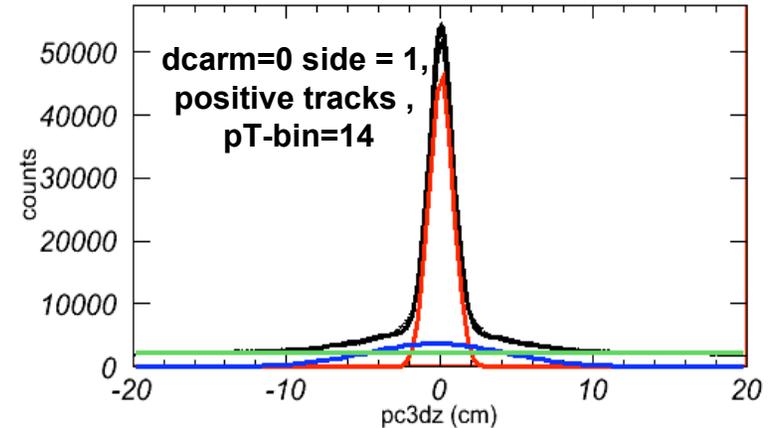
**For the purpose of all further studies define 4 run groups for RUN7. First divide in “+ -” and “- +” datasets (important :-). Then further divide each dataset in two groups based on PC3 FEM problem (probably less important :-).**



# PC3 Matching

## Strategy:

- Look at  $dz/d\phi$  residuals, fit with double gaussian + offset, parameterize  $p_T$  dependence
- Define matching in terms of sigma, look at  $p_T$  trend of sigma distribution



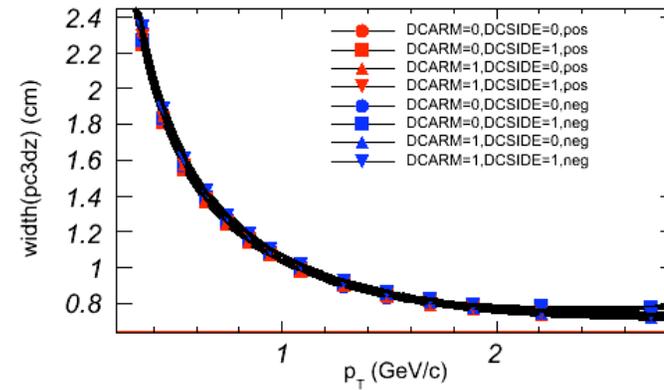
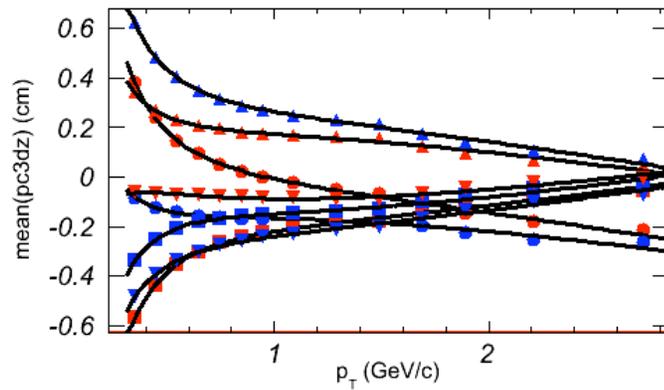
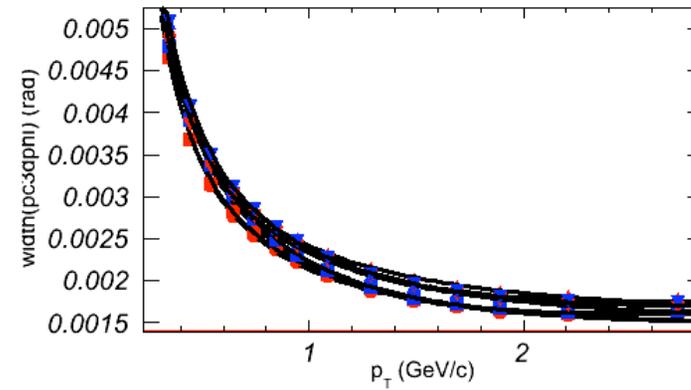
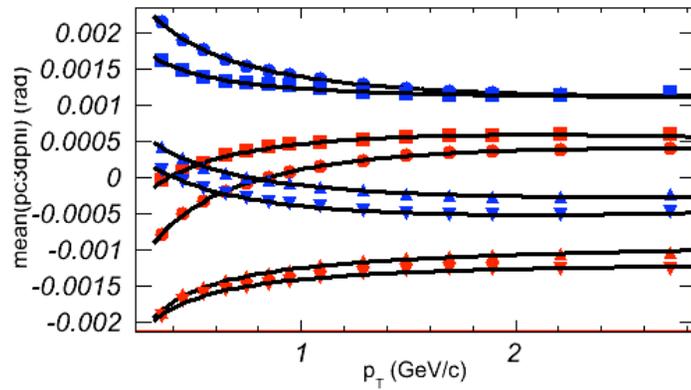
## Apply a few simple charged track cuts:

- DC quality = 31 || 63
- $n_0 \leq 0$  for  $p_T < 5$  GeV/c (RICH Veto)
- $|zed| < 75$ cm (DC fiducial cut)

... results for all four run groups follow



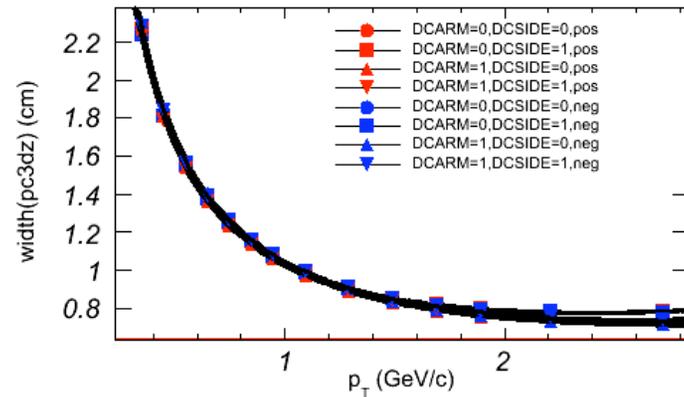
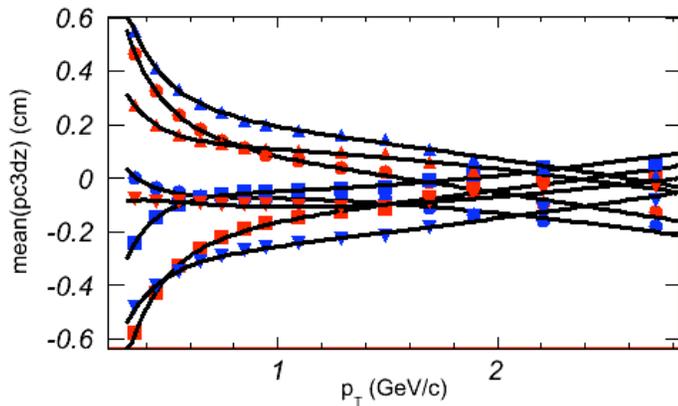
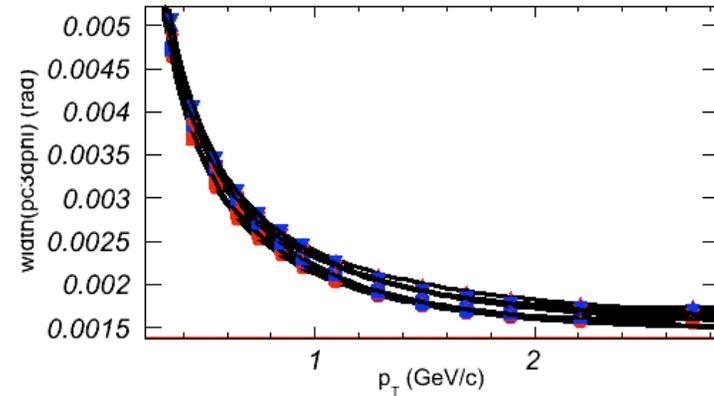
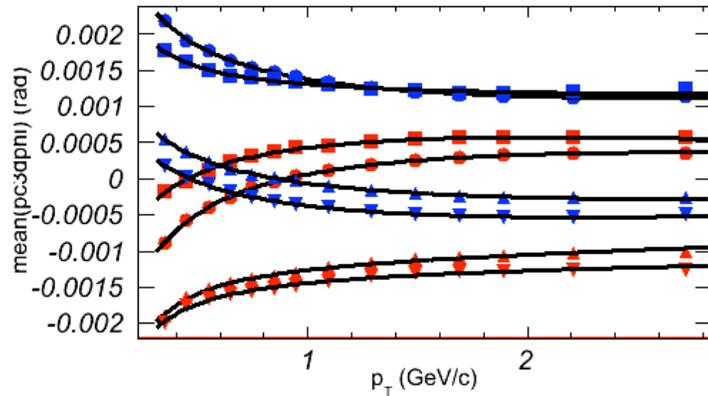
# PC3 Matching Residuals: Group 1



Reasonable parameterization is achieved



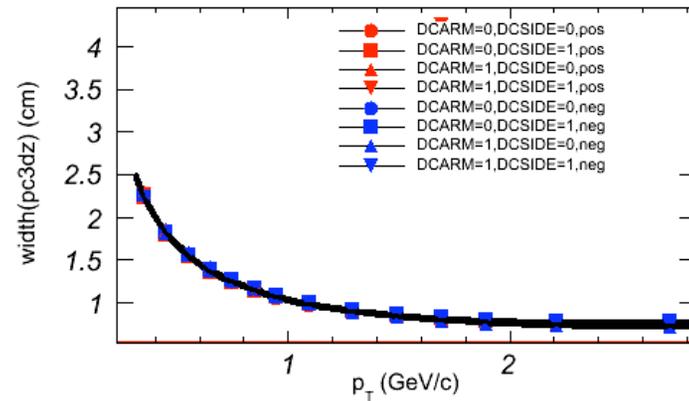
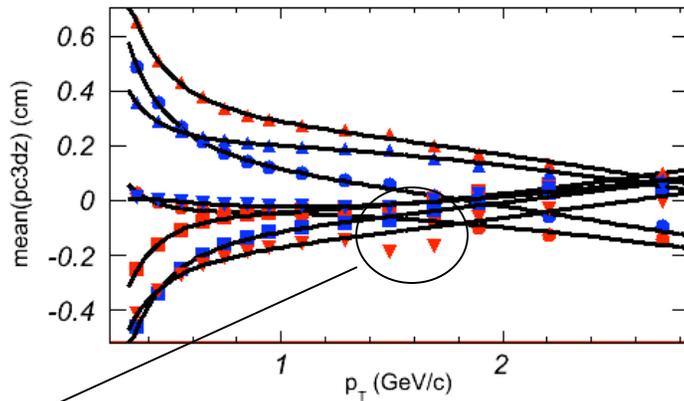
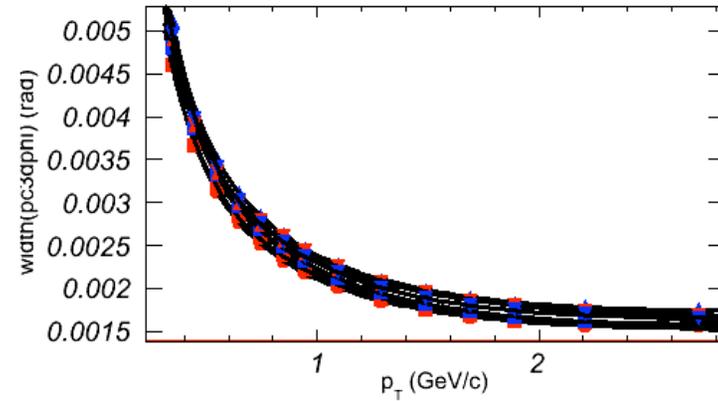
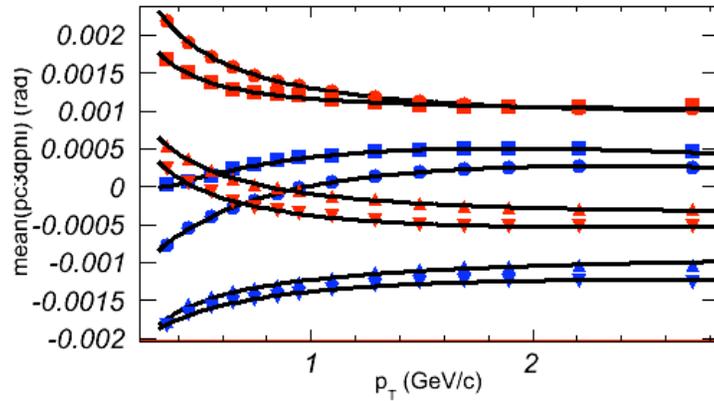
# PC3 Matching Residuals: Group 2



Reasonable parameterization is achieved



# PC3 Matching Residuals: Group 3

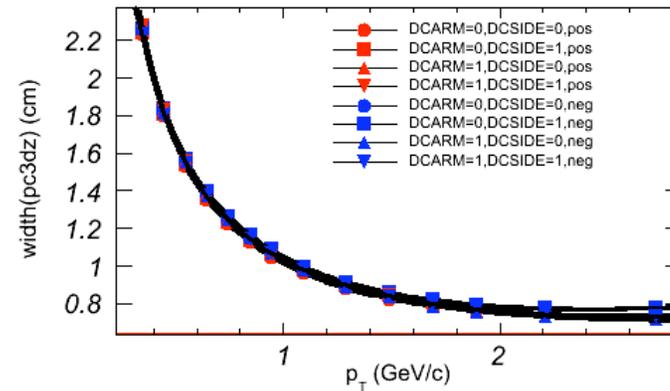
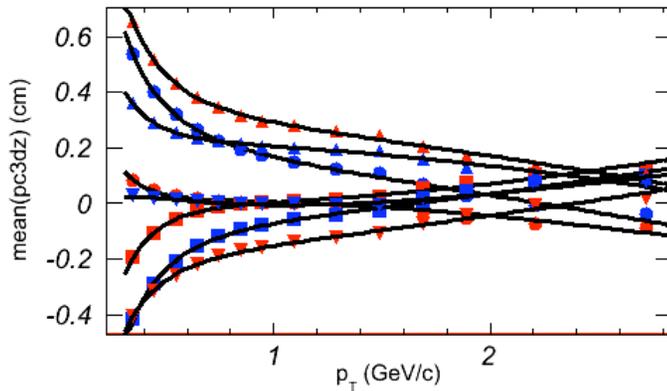
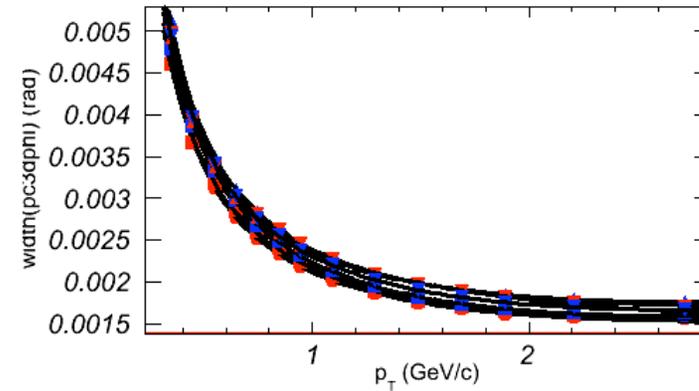
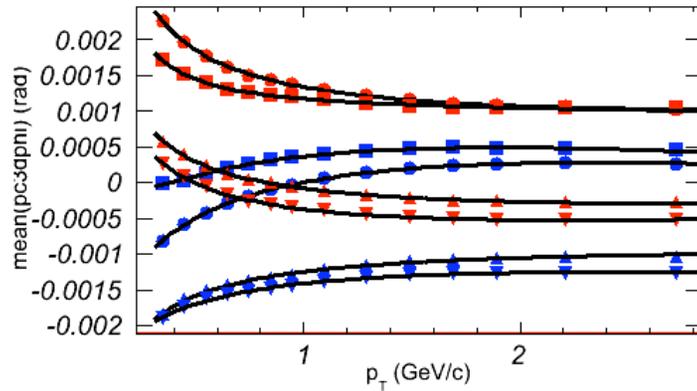


Those guys are being re-checked.

Reasonable parameterization is achieved



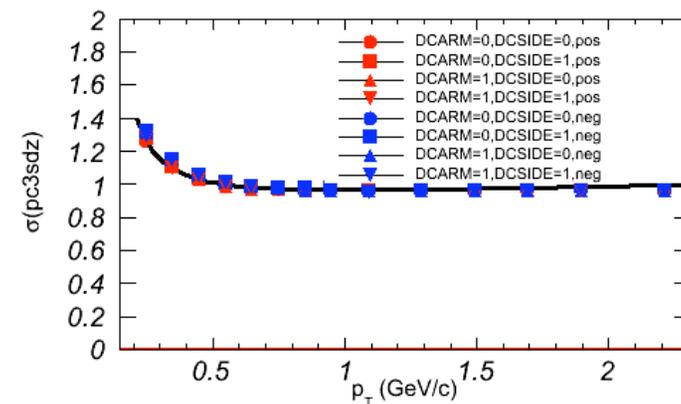
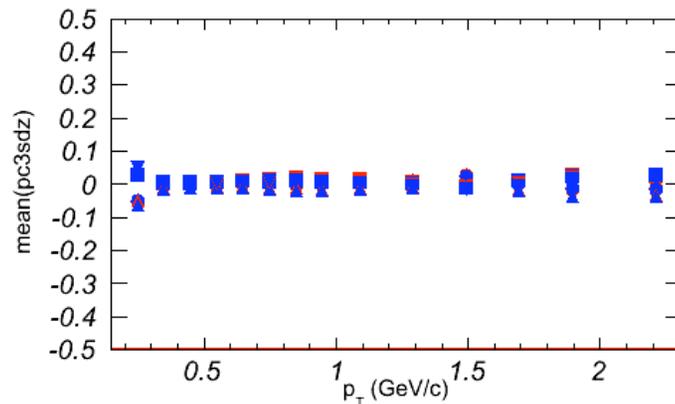
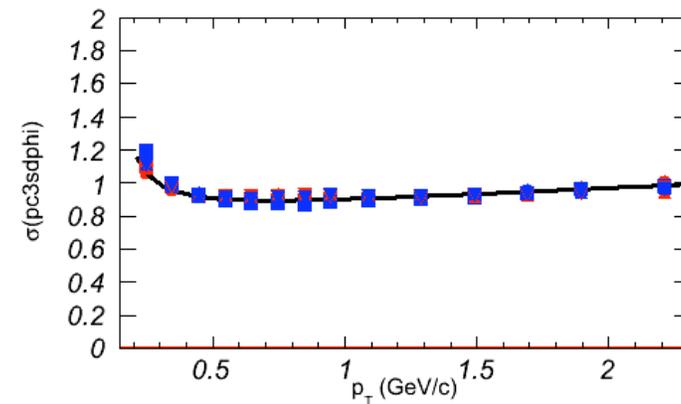
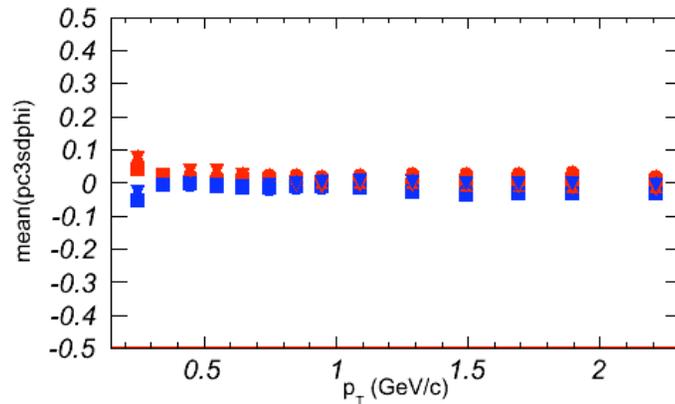
# PC3 Matching Residuals: Group 4



Reasonable parameterization is achieved



# PC3 Matching Sigma: Group 1

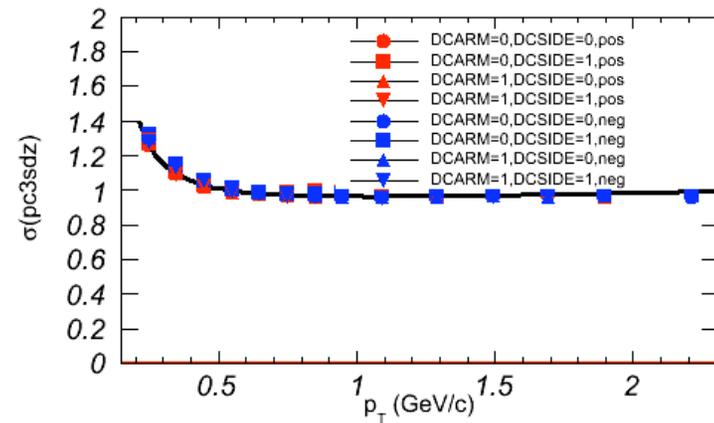
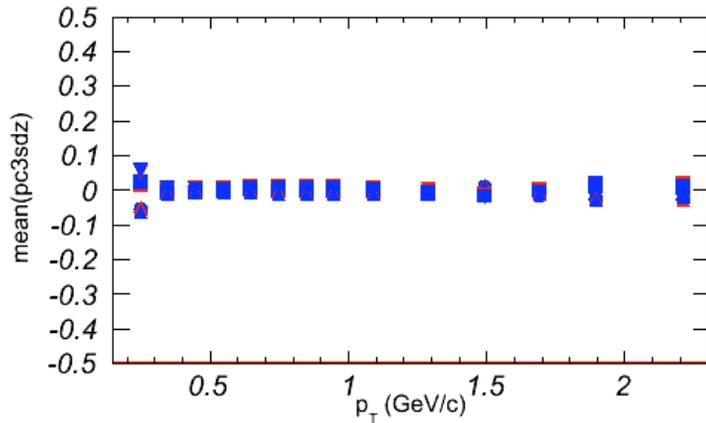
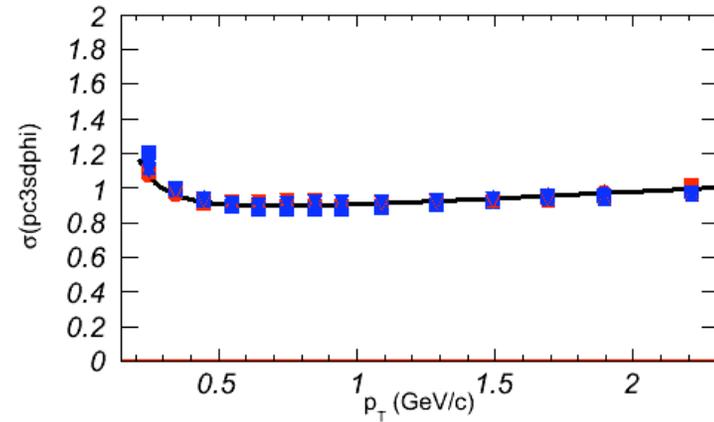
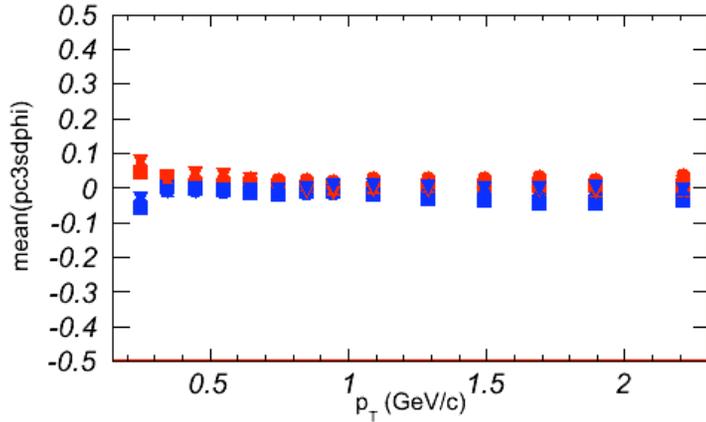


Good calibration of mean and sigma above 0.5 GeV/c

Afterburn the pc3sdphi/pc3sdz sigma to correct low  $p_T$  matching 9



# PC3 Matching Sigma: Group 2

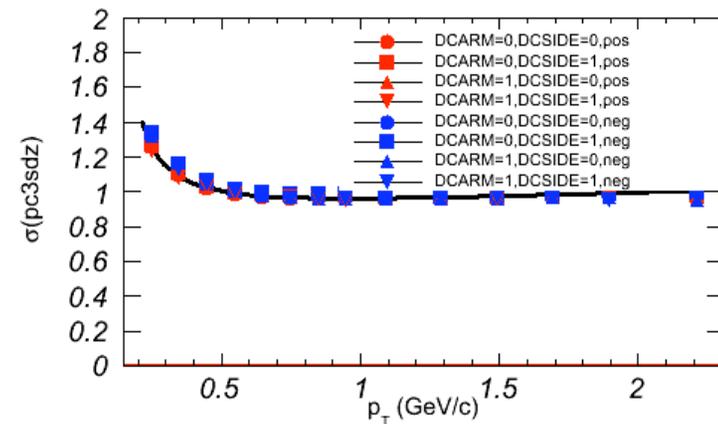
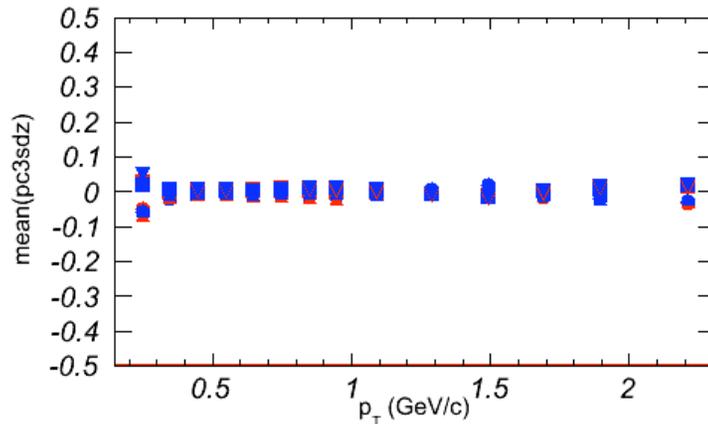
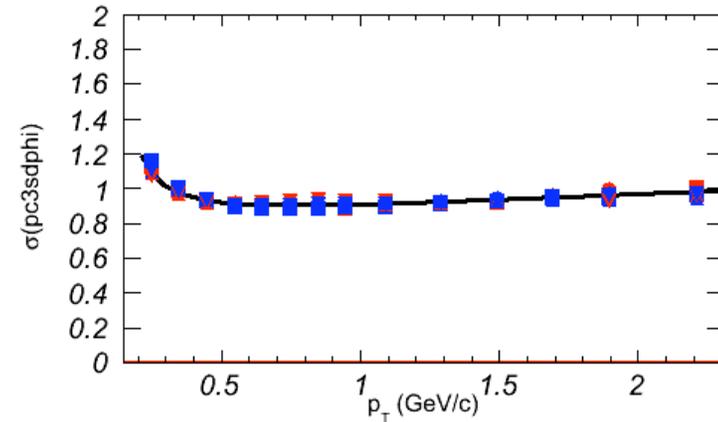
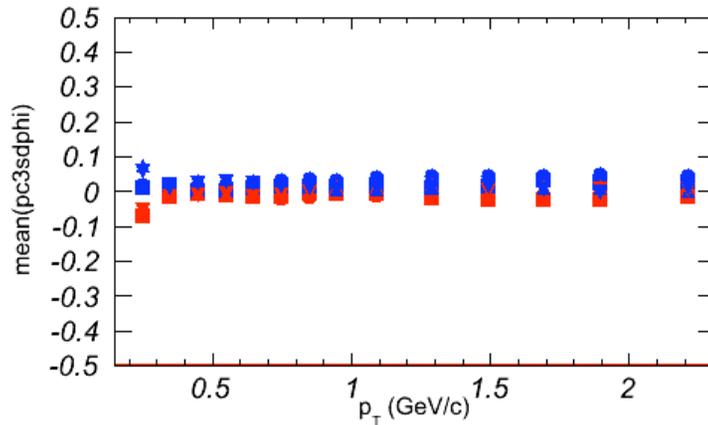


Good calibration of mean and sigma above 0.5 GeV/c

Afterburn the pc3sdphi/pc3sdz sigma to correct low pT matching <sup>10</sup>



# PC3 Matching Sigma: Group 3

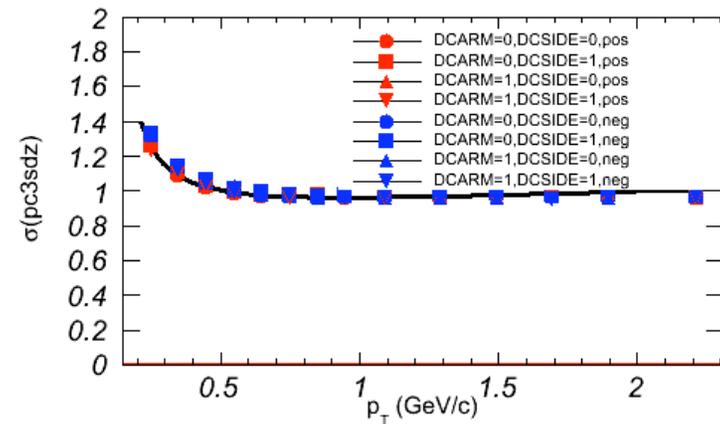
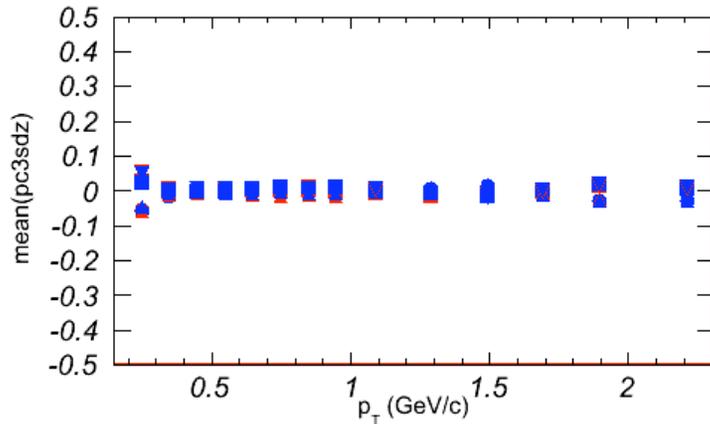
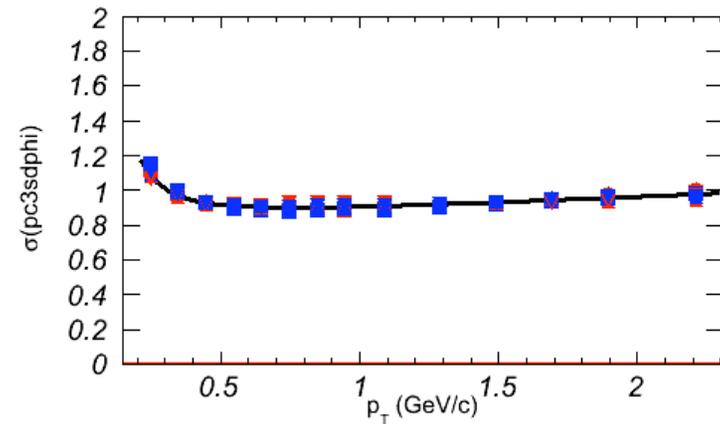
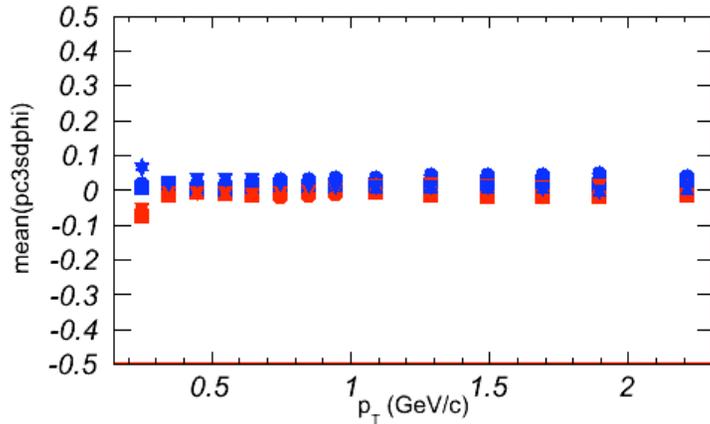


Good calibration of mean and sigma above 0.5 GeV/c

Afterburn the pc3sdphi/pc3sdz sigma to correct low pT matching <sup>11</sup>



# PC3 Matching Sigma: Group 4

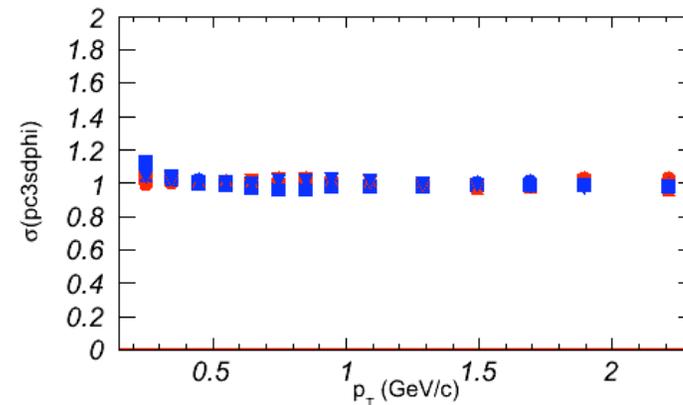
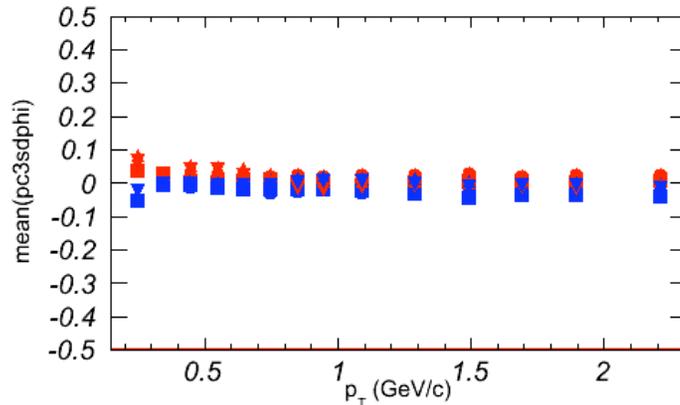


Good calibration of mean and sigma above 0.5 GeV/c

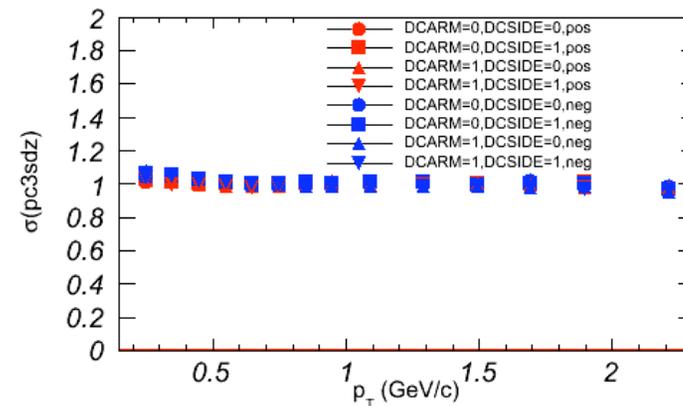
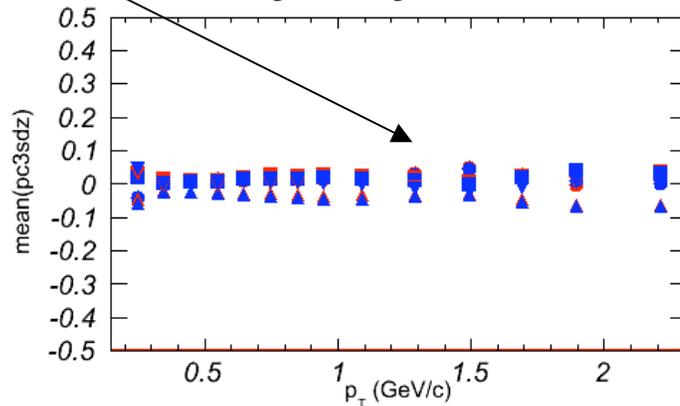
Afterburn the pc3sdphi/pc3sdz sigma to correct low  $p_T$  matching <sup>12</sup>



# Afterburned PC3 Matching Sigma: Group 1



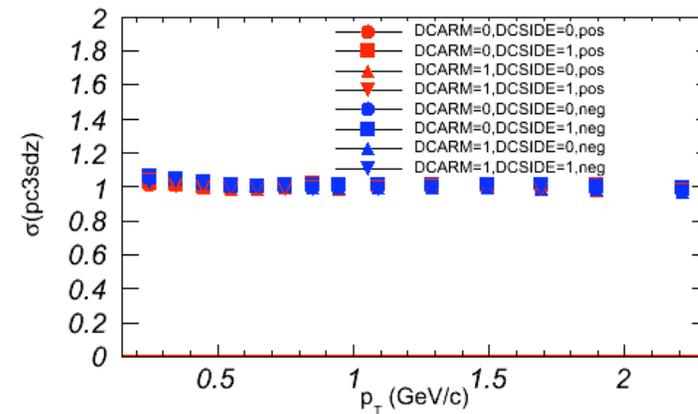
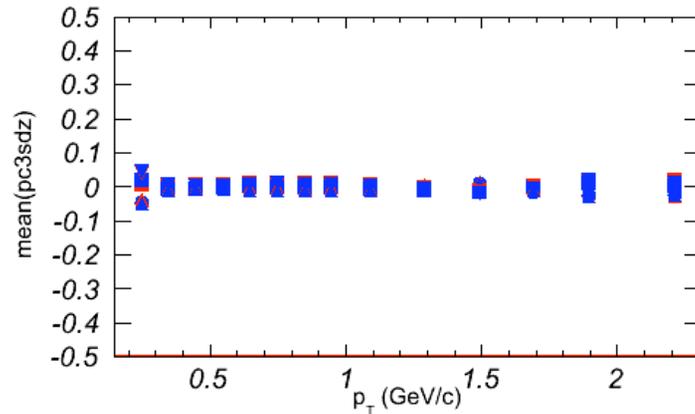
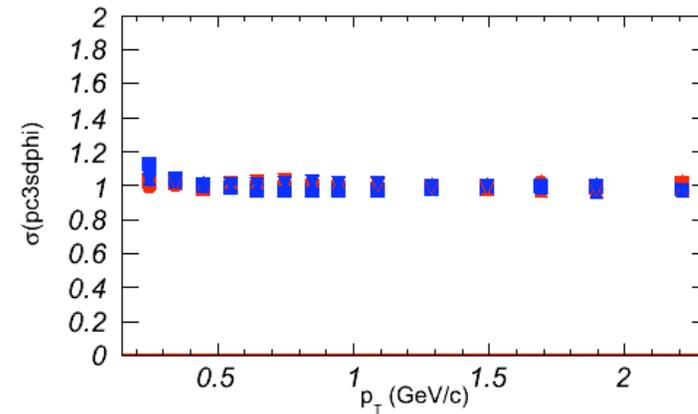
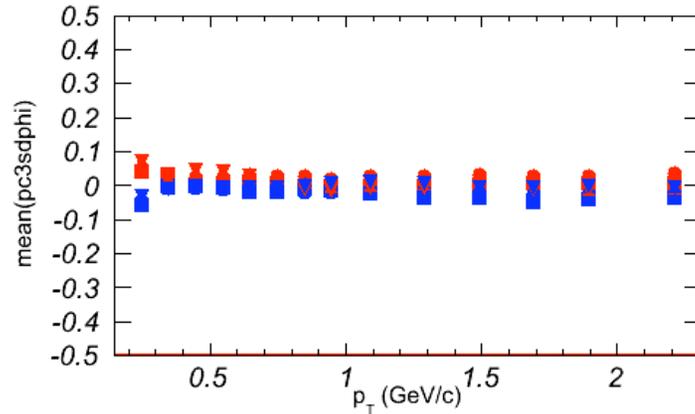
**This is the worst of all 4 rungroups. You always have a trade-off between mean and sigma calibrations. I consider a mean pc3sdz < 0.1 good enough for my analysis at this stage...**



**Good mean and sigma after all recalibrations are applied!**



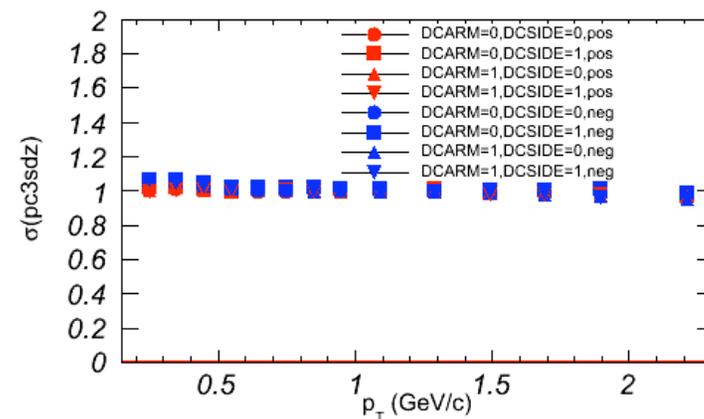
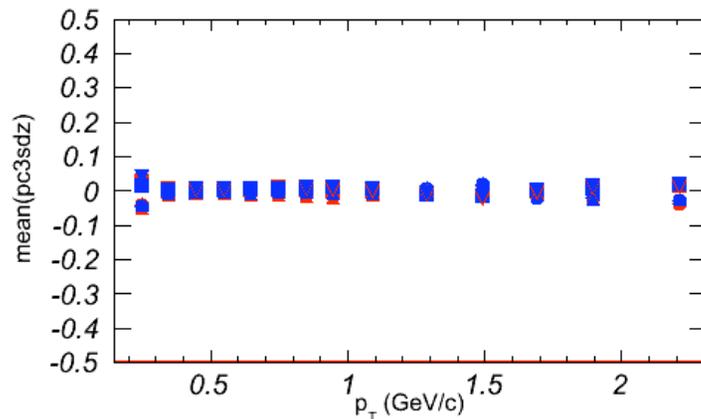
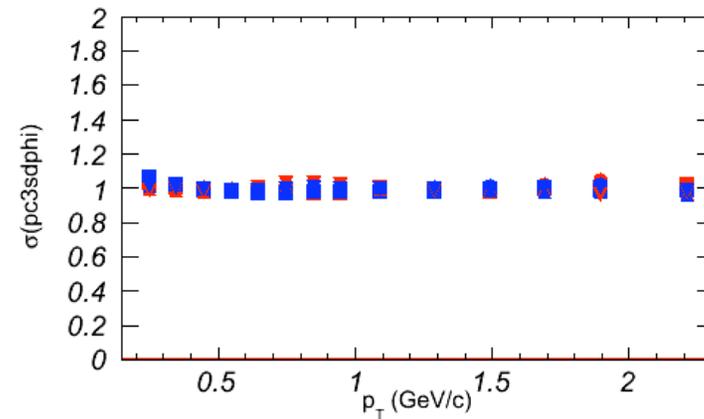
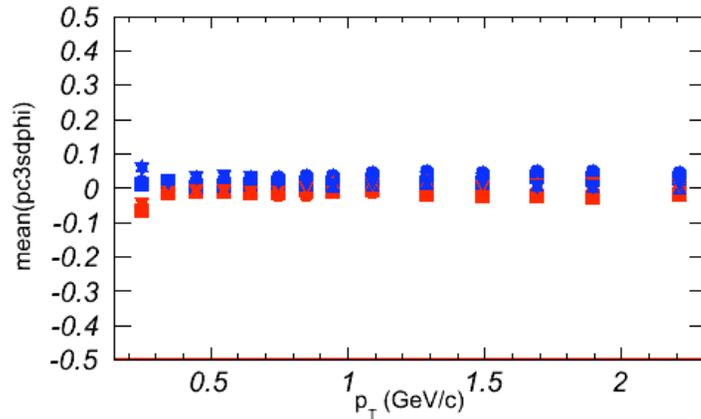
# Afterburned PC3 Matching Sigma: Group 2



Good mean and sigma after all recalibrations are applied!



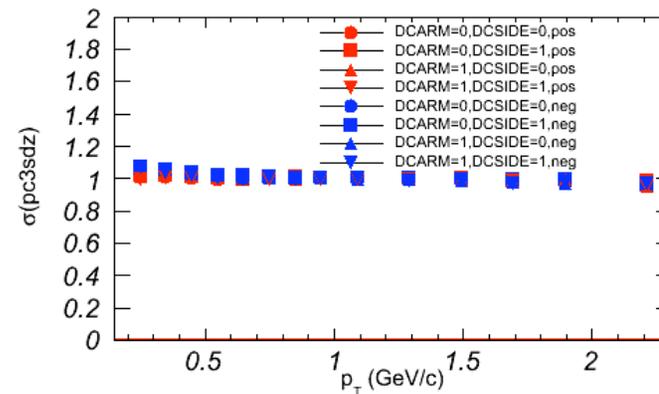
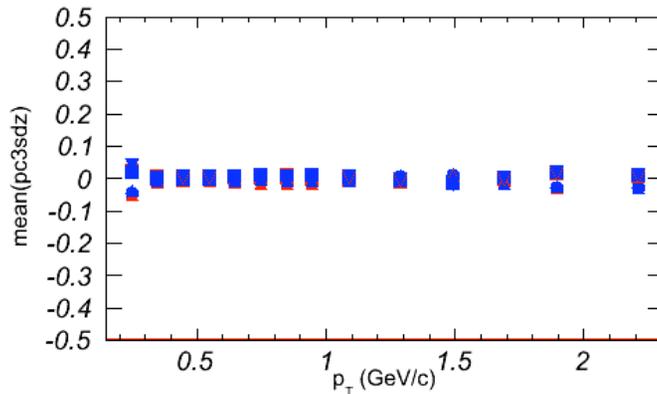
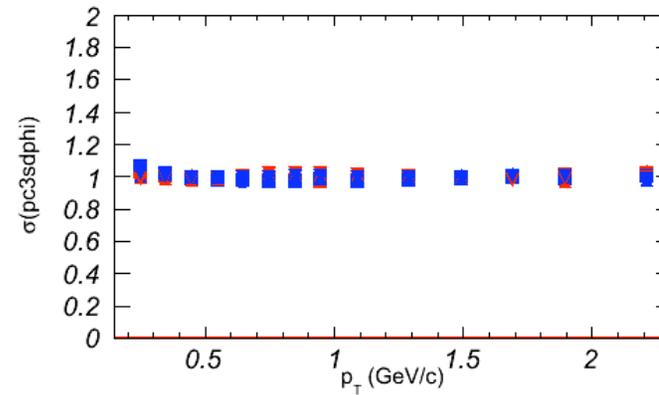
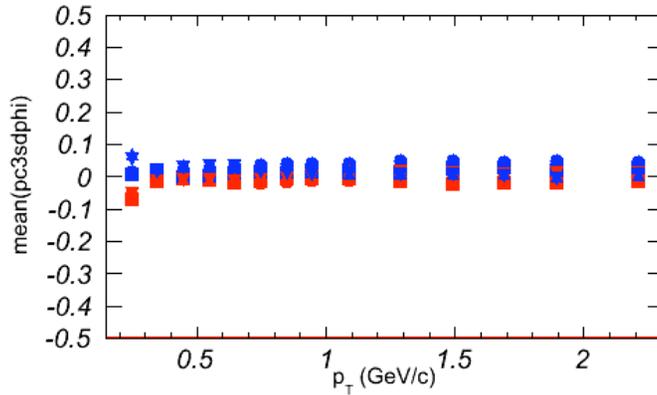
# Afterburned PC3 Matching Sigma: Group 3



Good mean and sigma after all recalibrations are applied!



# Afterburned PC3 Matching Sigma: Group 4



Good mean and sigma after all recalibrations are applied!



## Summary

**Basic PC3 matching recalibration has been finished.  
This can be turned into a Recalibrator, as soon as a scheme for adding  
pc3sdz/pc3sdphi to the CWG's has been implemented.**