

Outer Only Tracking – Distortion Plots

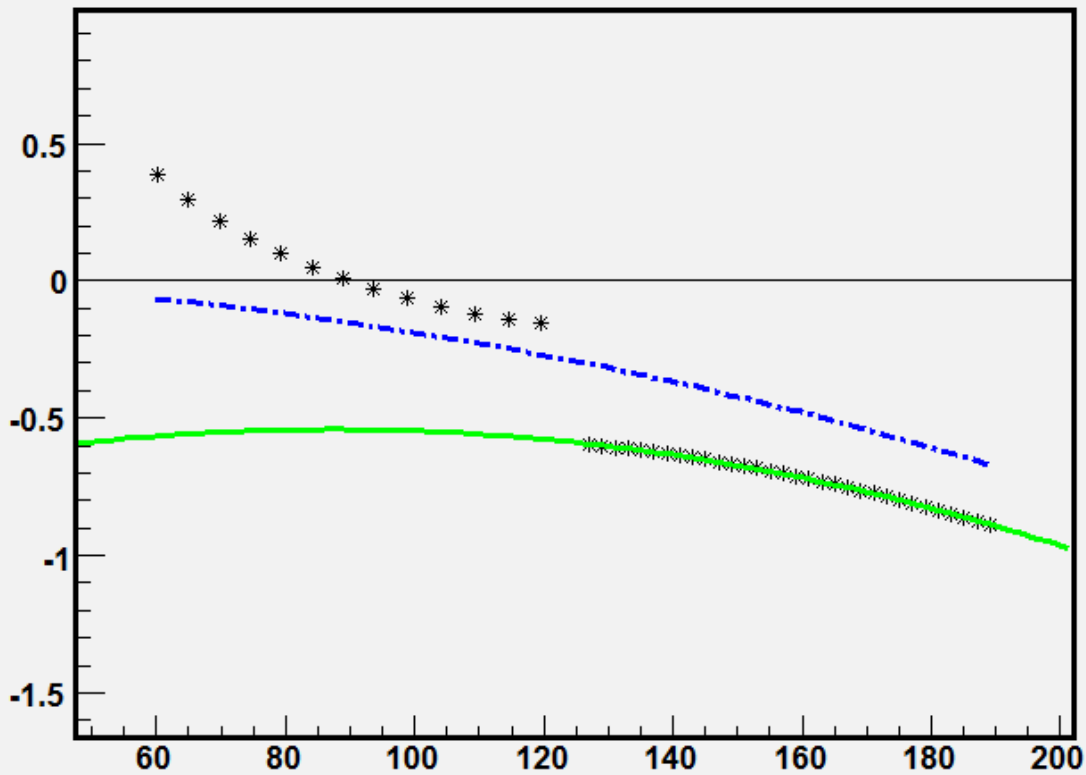
Showing the effect of distortions when you do outer-sector-only tracking

by Jim Thomas

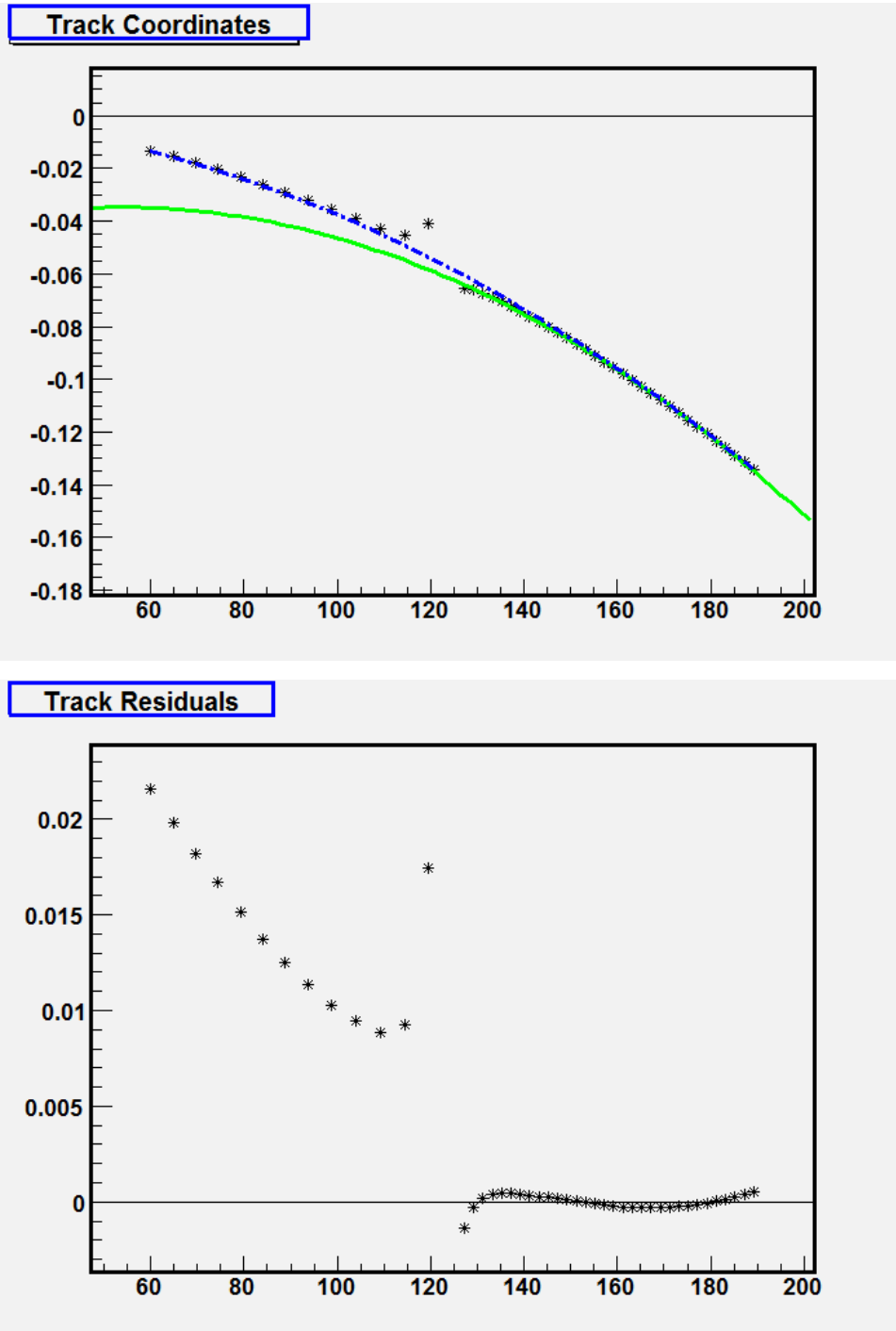
What do the normal suite of distortions in the TPC look like if you do “outer-only” tracking? A few examples are shown below. They show you what you might expect to see if there is an uncompensated distortion in the data while doing (for example) alignments studies for the inner and outer sectors. Note that this is not a simulation of normal tracking ... so don't look at these plots to diagnose distortions in normal tracking. Radius on the horizontal axis and track data on the vertical axis. All units are in centimeters.

A random example is shown below ... to illustrate that the original (undistorted) track is shown in blue, the distorted points (as we observe them) is shown by black asterisks, and the fit to the outer data points (only) is shown in green. Inner error bars taken to be 100x normal.

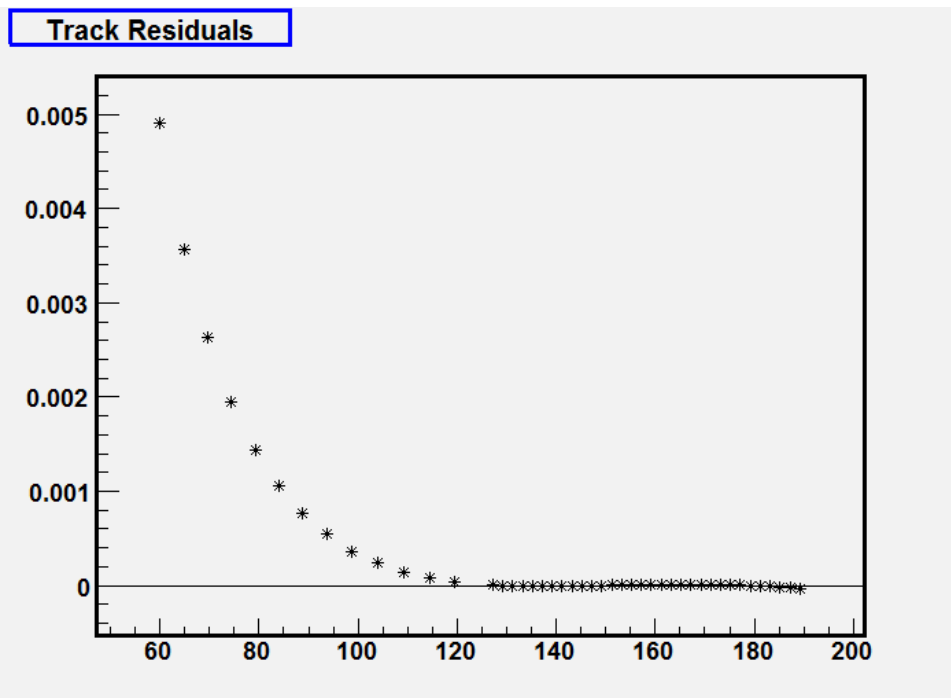
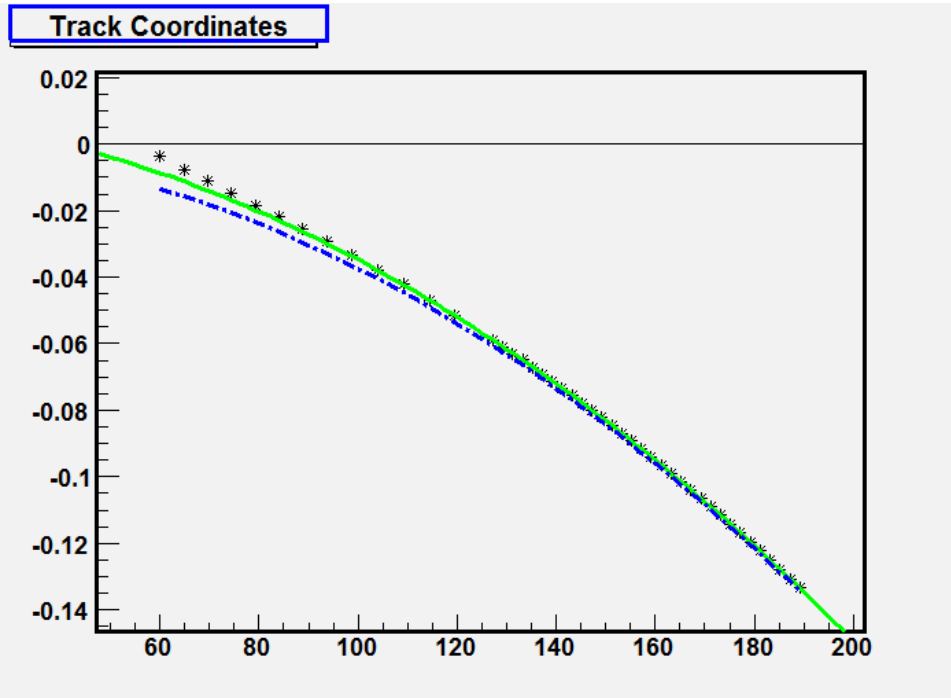
Track Coordinates



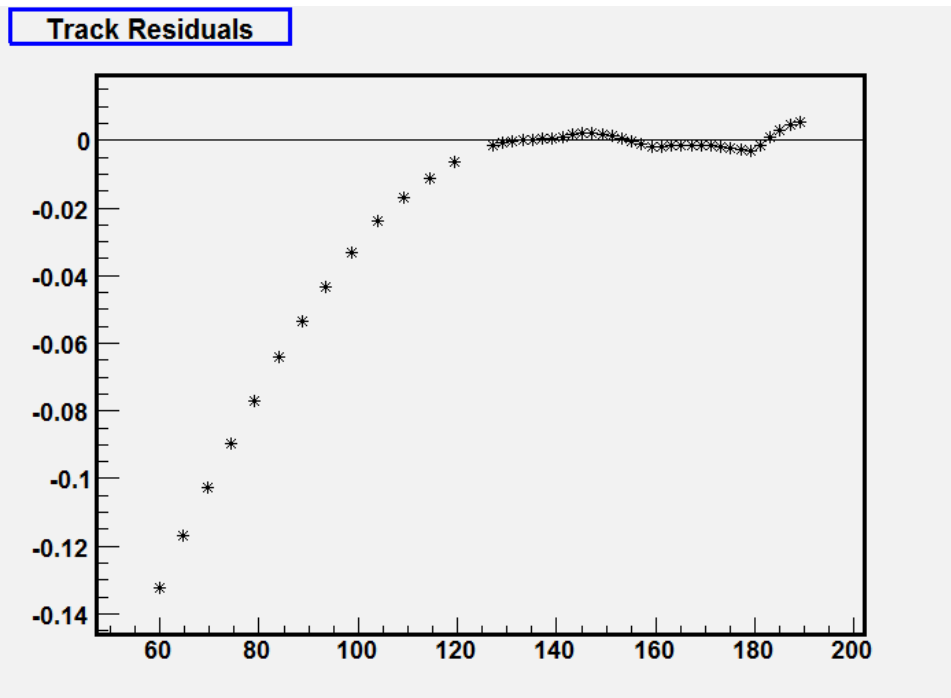
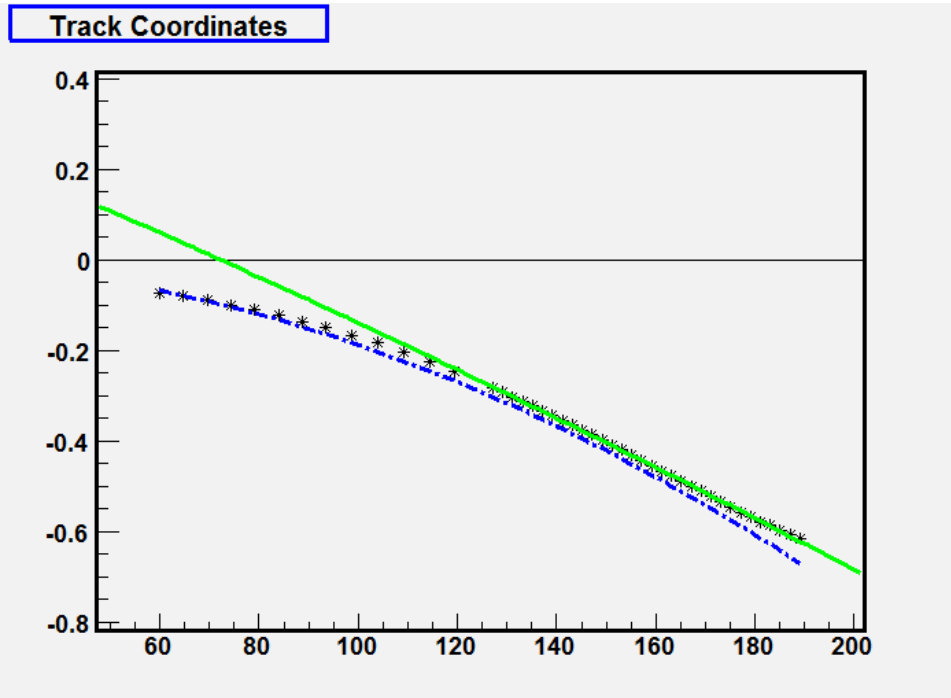
PadRow13 distortion correction. The upper plot is for a 200 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.



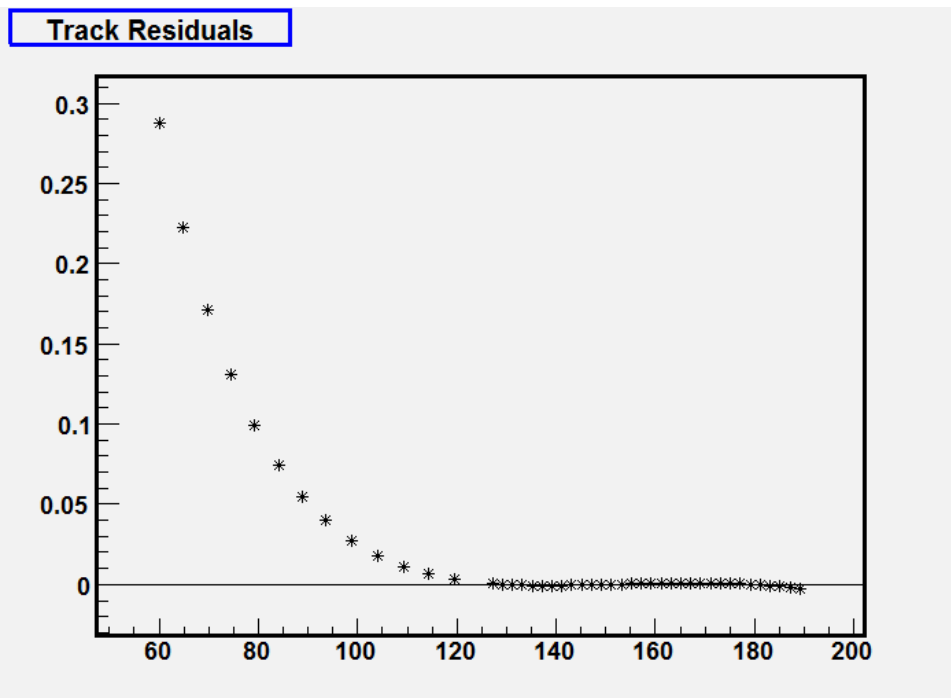
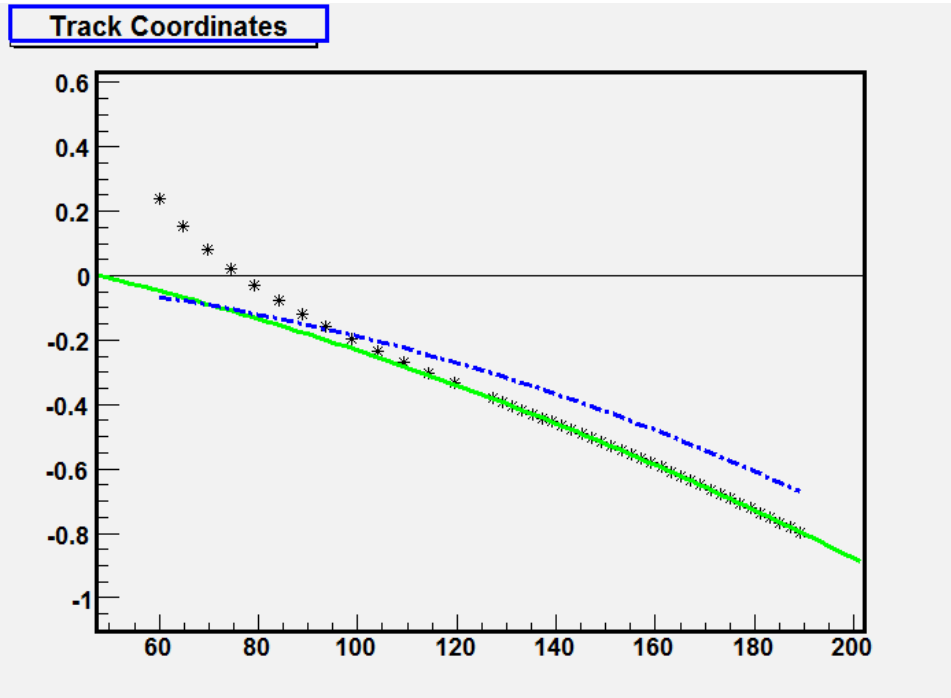
IFC_shift distortion correction. The upper plot is for a 200 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.



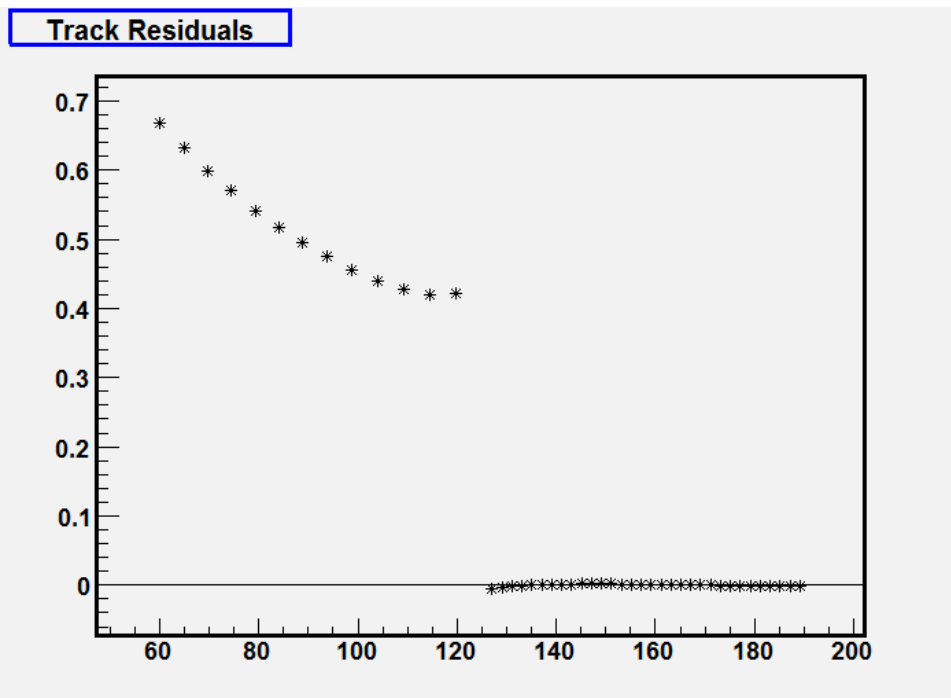
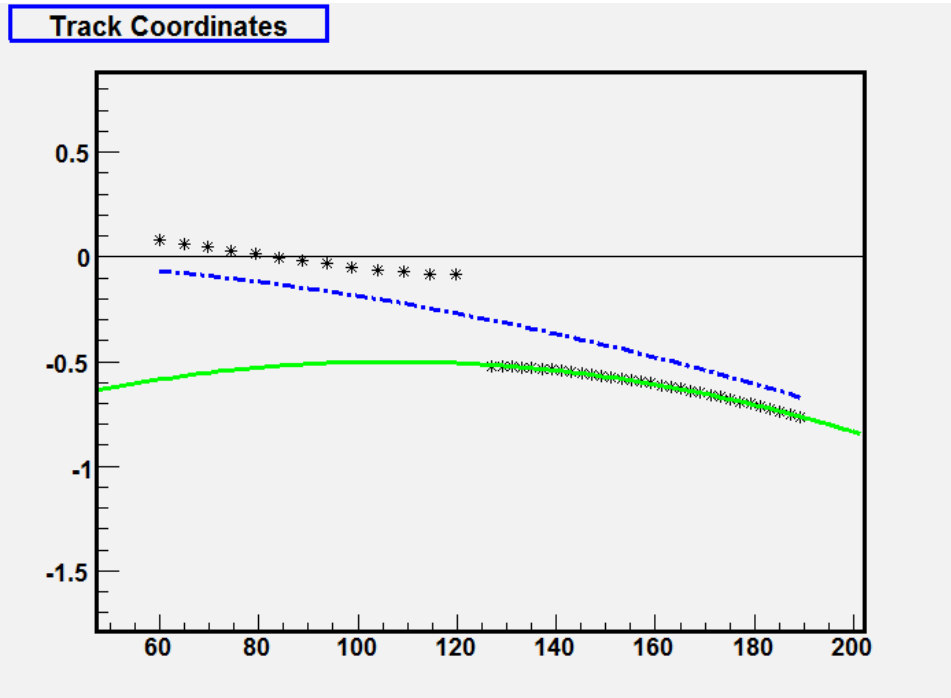
BField Shape distortion correction. The upper plot is for a 40 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.



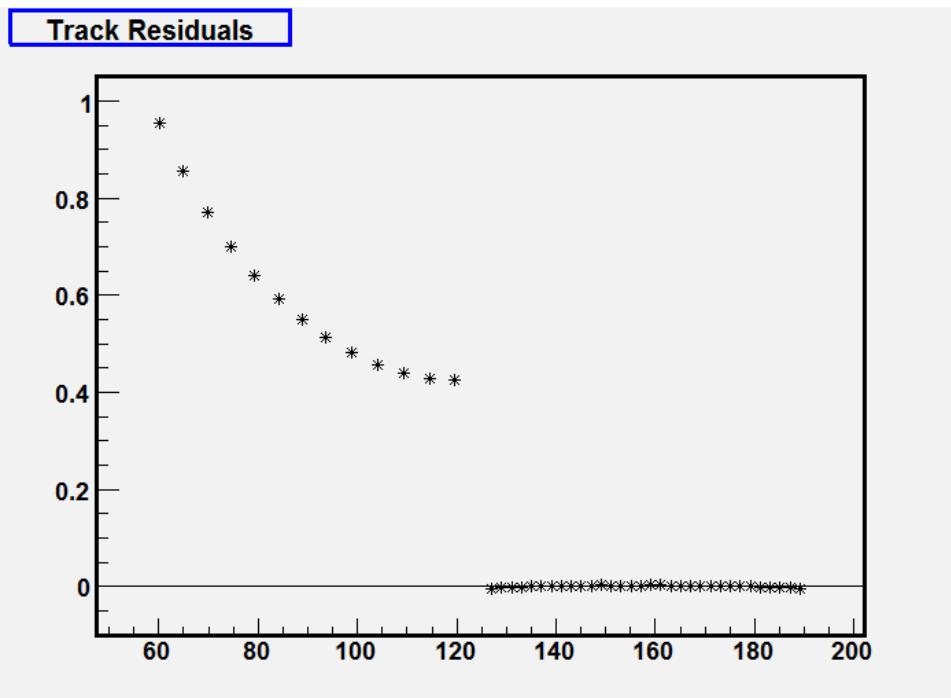
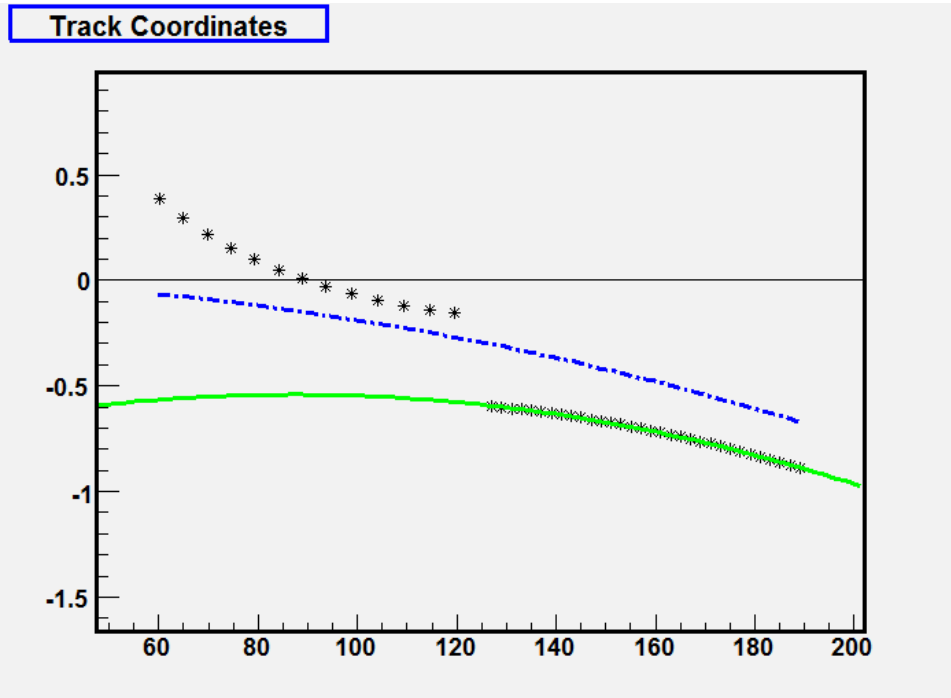
SpaceCharge distortion correction. The upper plot is for a 40 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.



Grid Leak distortion correction. The upper plot is for a 40 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.



SpaceCharge and GridLeak distortion correction. Added in normal ratio. The upper plot is for a 40 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.



Shorted Ring on OFC 180. The upper plot is for a 40 GeV track. Lower shows residuals to the fit track. Original track in blue, distorted points in black, fit track (outer only) in green. Residual plot is black to green.

