



Residual \vec{B} -field Errors

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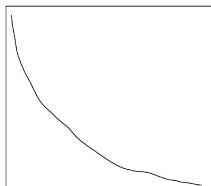
\vec{B} -field error cancellation method

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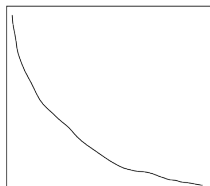
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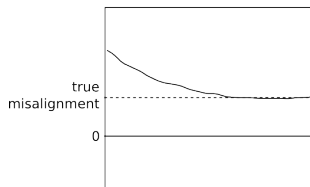
30% more of these



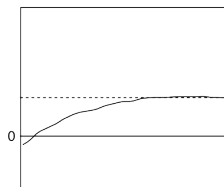
positively-charged p spectrum



negatively-charged p spectrum



residuals versus momentum

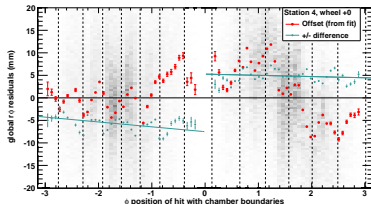


residuals versus momentum

- ▶ Alignment measurement is the simple average of residuals in the positively-charged track bin and the negatively-charged track bin
- ▶ Assumption: momentum spectra for the two charges is the same (also used by charge ratio analysis)

An extreme case

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- ▶ Worst \vec{B} -field errors in station 4
- ▶ Blue points are half the *difference* between the two bins; the error we would make if we used 100% positive tracks and 0% negative tracks
- ▶ If we simply averaged all tracks, the systematic error would be 13% of the blue points
- ▶ The actual error is suppressed by the difference in 20 GeV momentum cut-off between the two charge signs, the fraction of charge misassignment, etc.
- ▶ It's easily less than 1% of the blue points (small enough to worry about other effects, first)