

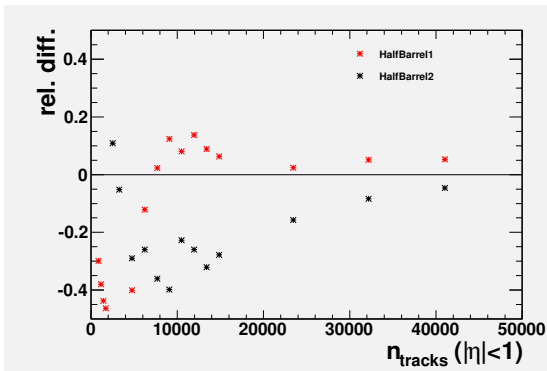
Pixel Half Barrel Alignment

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2010

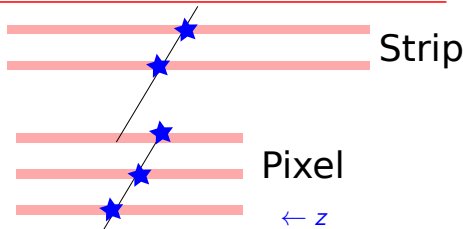
Misalignment Scenario

- MC → Fall10 MinBias 7TeV-pythia8 ALCARECO
- misalignment scenario applied
 - pixel half barrels shifted by $\pm 50 \mu\text{m}$ along global z direction
- track cuts: $p > 3 \text{ GeV}$, $p_T > 0.65 \text{ GeV}$, $n_{Hit} \geq 8$, $-1 < \eta < 1$
- relative difference between extracted alignment constants and applied movements
- only alignment constants for the pixel half barrels were determined
- using ≈ 40000 tracks the alignment precision is about 5%
- possible next steps: n_{tracks} → luminosity, use data instead of MC?



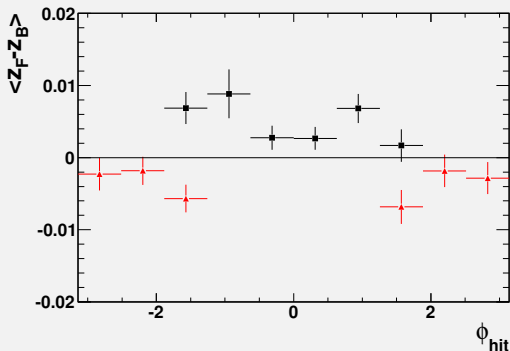
Monte Carlo Study of Pixel Half Barrel Movements

- **pixel layer 3** → difference between z position as predicted by the **forward** and **backward** trajectory states on surface
- plot average, $\langle z_f - z_b \rangle$, as a function of ϕ_{hit}



Example:

- misalignment was applied to the MC (Minimum Bias)
 - **track cuts:** $p > 10$ GeV,
 $p_T > 0.65$ GeV,
 $n_{Hit} \geq 8$, ...
- shifts visible, but limited sensitivity!



Data

minimum bias run B

- IOV dependent alignment constants
- track cuts: $p > 10$ GeV,
 $p_T > 0.65$ GeV,
 $n_{Hit} \geq 8$, ...
- possible next steps: study the movement without applying alignment constants?

