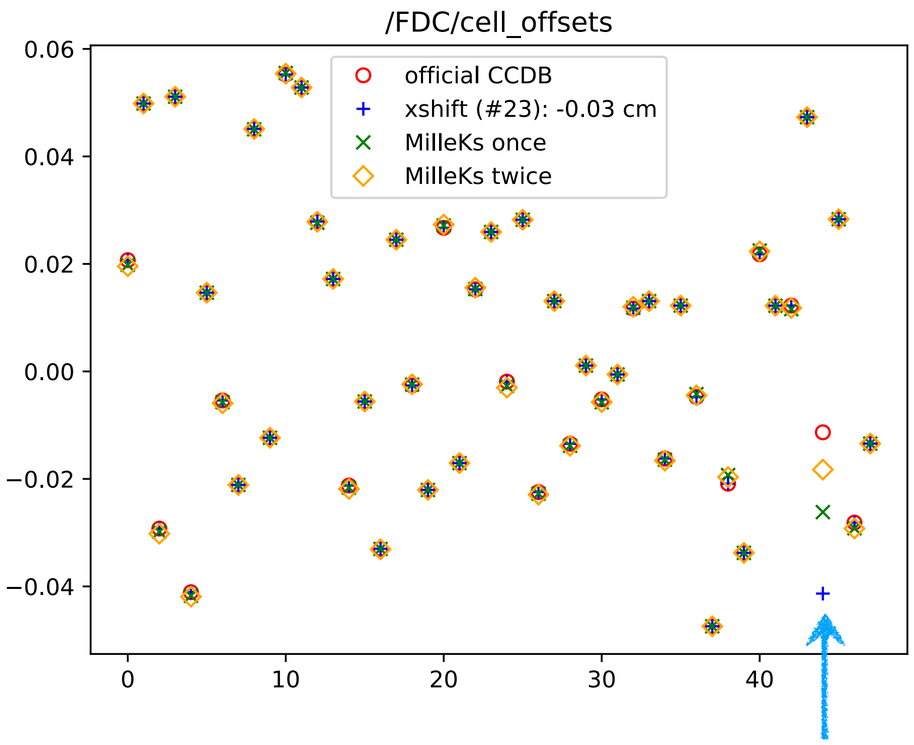
Validity check of MilleKs

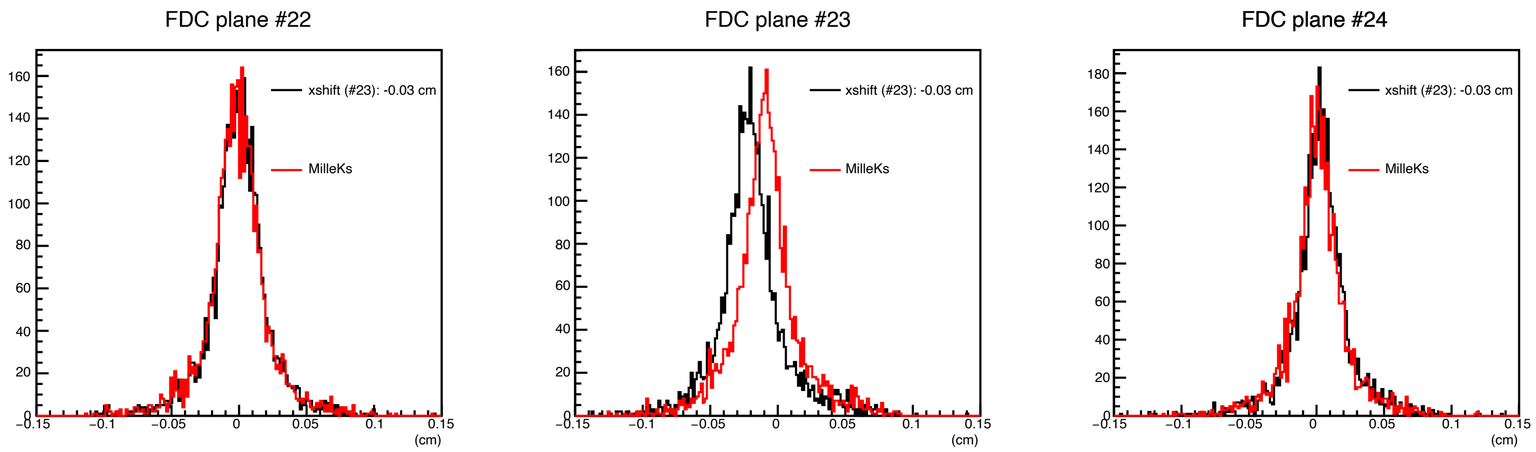
A plugin **plugins/Alignment/MilleKs** is prepared to utilize K_S events for the alignment.

Shift one alignment parameter (x offset value for FDC plane 23) and apply MilleKs to check whether it can resuscitate the parameter.



Offset (local x) for FDC plane 23

Wire residuals

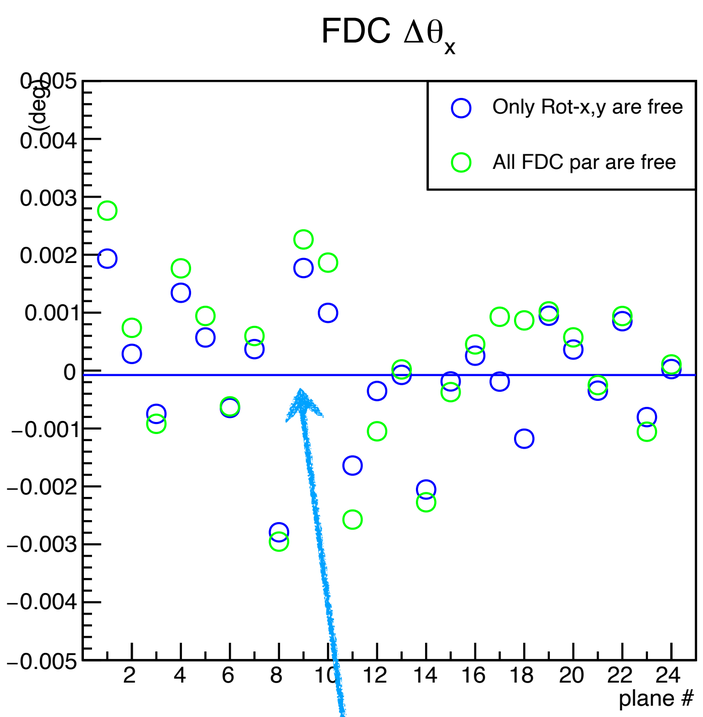


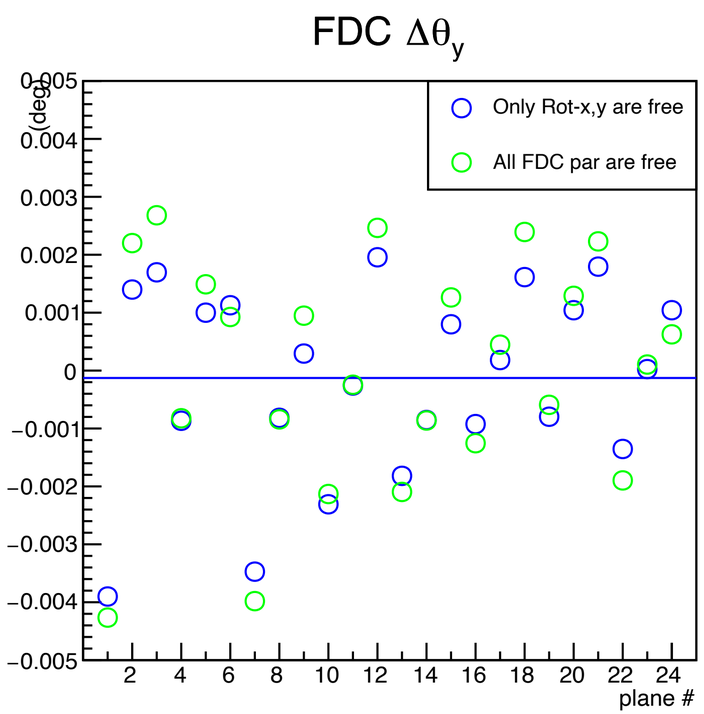
MilleKs nudges alignment parameters in the proper direction.

FDC rotation (θ_x , θ_y)

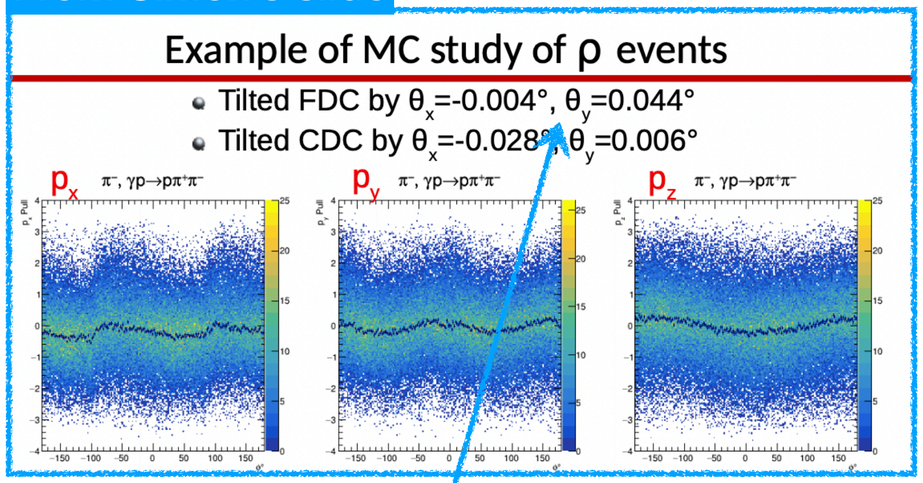
[/FDC/cell_rotations]

Differences of the rotation parameters





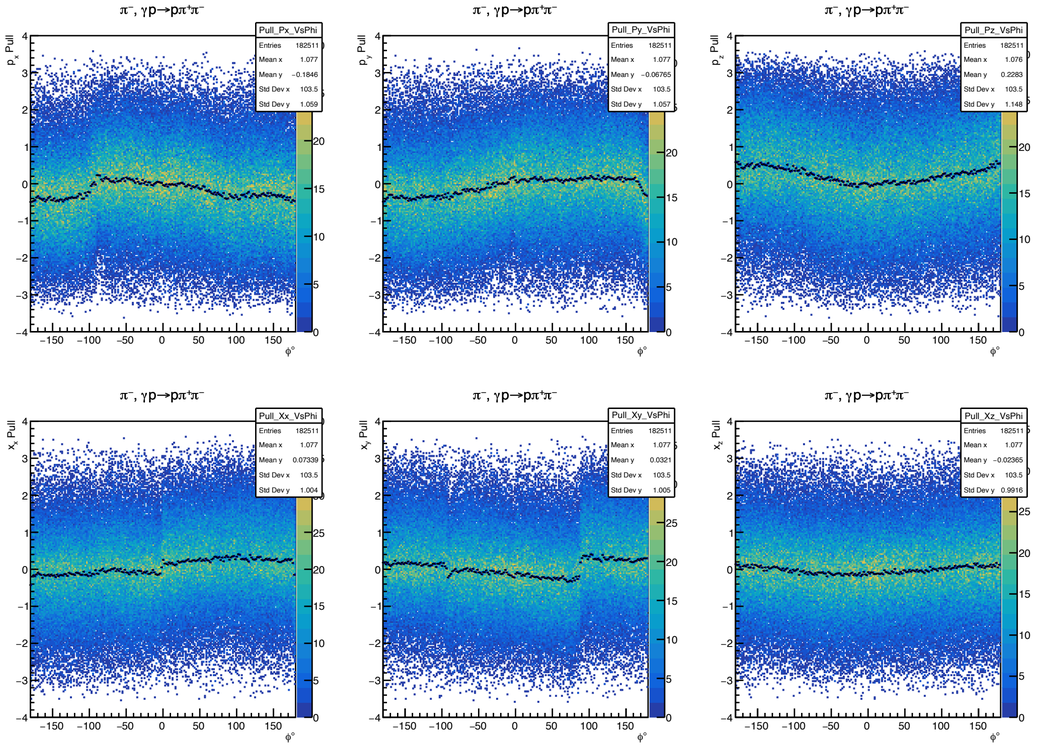
From Simon's slide



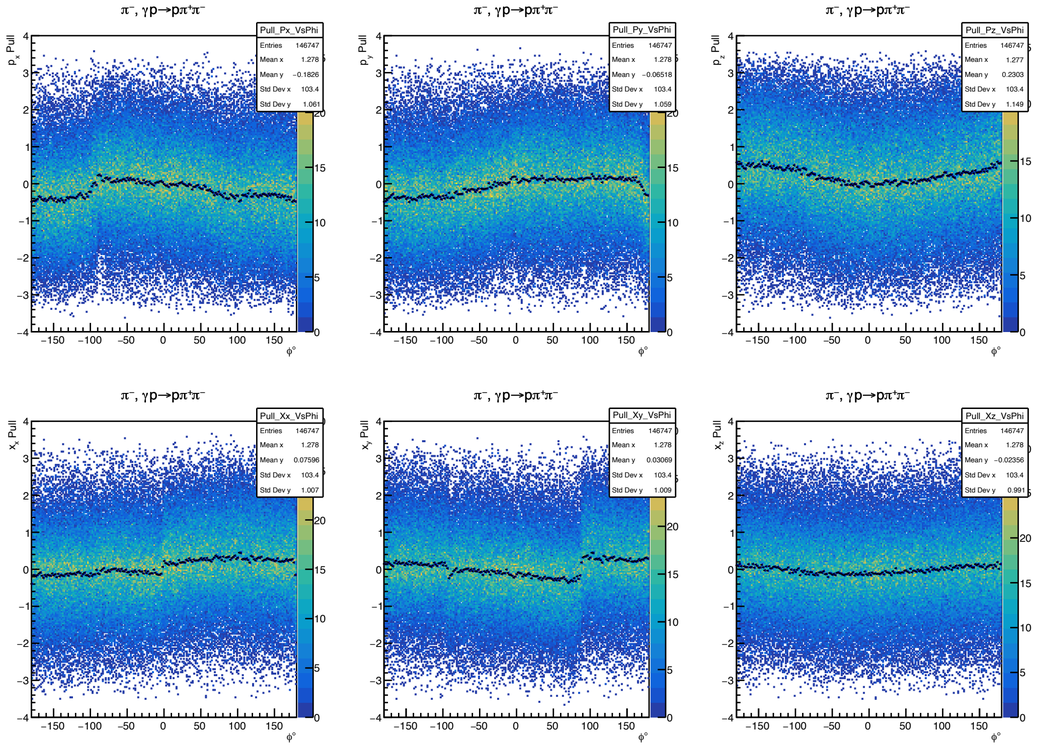
Horizontal lines are the results with constraints: $\Delta\theta_x^{\text{plane 1}} = \Delta\theta_x^{\text{plane 2}} = \cdots = \Delta\theta_x^{\text{plane 24}}$

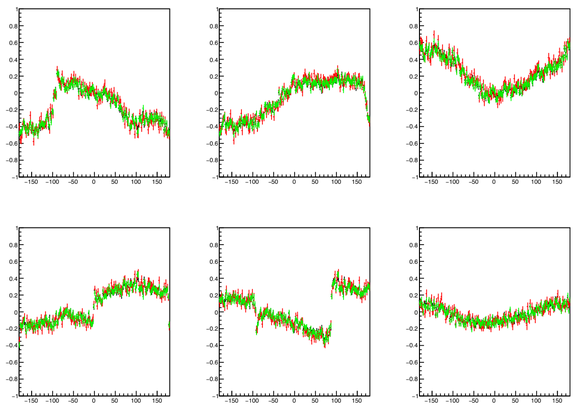
Obtained results are much smaller than Simon's values (~0.04 deg).

Pull vs azimuth angle



MilleKs





ProfileX plots for above figures.
(Black: Official CCDB, Red: All FDC par free. Green: Only Rot-x,y are free)

Azimuth angle dependence does not change at all.
The obtained results (diff. of alignment parameters) are too small.

CDC rotation (θ_x ,θ_y)

[/CDC/global_alignment]

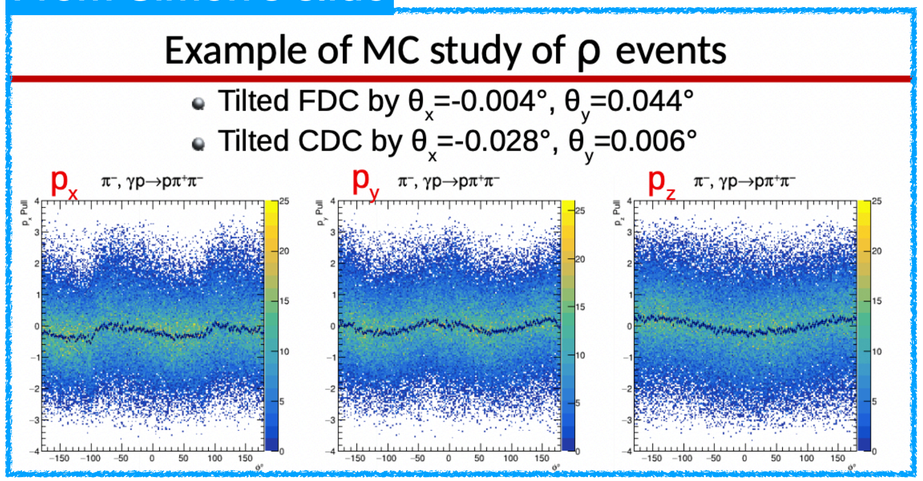
MilleKs results

$$\Delta\theta_x = 0.0006^\circ$$

$$\Delta\theta_y = -0.0003^\circ$$

Again, results are very small compared to Simon's value (~0.03 deg).

From Simon's slide



Summary

- MilleKs works as a minimizer and I confirmed that it improves residual distributions.
- But it's results for rotation parameters are too small to explain the phi-dependence of the pull distributions.