

Tracker Meeting: simulation of the first station calibration in a vertical position

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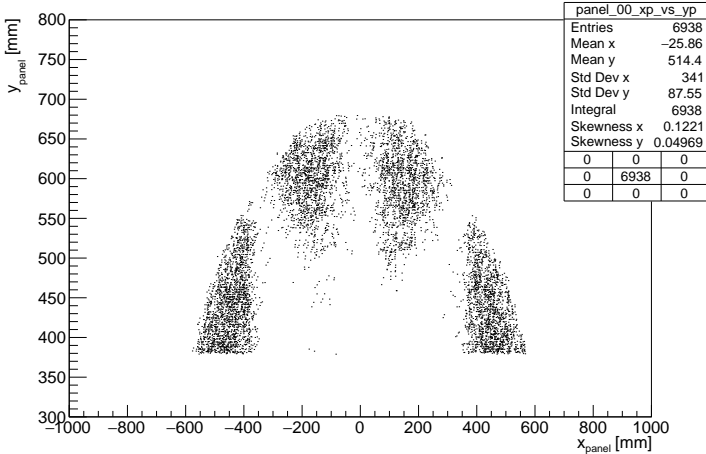


Cosmics simulation and selection criteria

- A simulation has been performed to reconstruct cosmics for the calibration of the station, which is vertically oriented, aiming to understand possible biases in determining longitudinal position caused by the non-uniform illumination of a panel;
- Selection of the first station;
- Vertical and extracted position;
- No magnetic field;
- To reconstruct a straight line in 3D, at least 4 hits at different z are needed: tracks selected with $nhits_{face_i} \geq 1$;
- To improve the resolution, $nhits_{panel_i} \leq 3$ were selected.

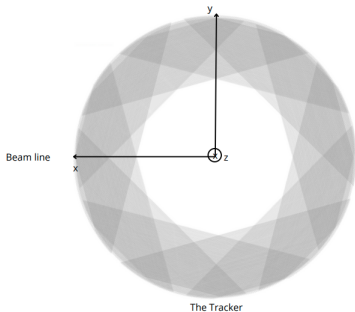
Panel illumination

Run 1210, plane0, panel0: x vs y, panel frame



Reconstruction of Cosmic tracks

- The station is not yet calibrated:
whether a straw has been hit or not is the only info we have;
- The reconstruction of the hit position is performed using:
 - the straw direction;
 - the straw midpoints (x, y) ;
 - the straw z coordinate.
- The intersection of two straw in two different faces, in the same plane, is considered to be the hit point;
- Two intersection points are found
→ reconstructed line.



Combo, Stereo Hits and Reconstructed line

1. Geometrical Combo Hits

Determination of a unique straw in a panel:

- mean of straws midpoint (x_m, y_m, z_m) ;
- straws direction (D_x, D_y) .

2. Geometrical Stereo Hits

Determination of the hit point in a plane:

- intersection point (x, y) using the two straws directions and midpoints;
- mean of z coordinate between the two faces.

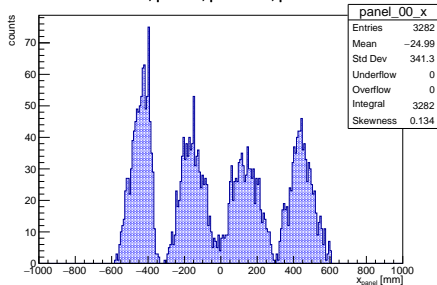
3. Reconstructed Line

Determination of a unique reconstructed track:

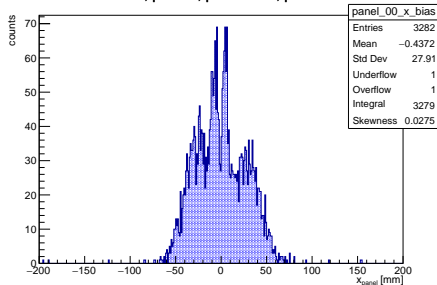
- one stereo hit per plane: one line reconstructed geometrically;
- the intersection point of the line with panels is found knowing the z_m coordinate.

Results

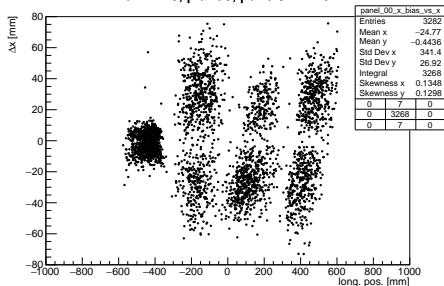
Run 1210, plane0, panel0: x, panel frame



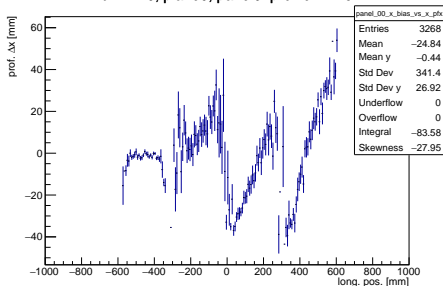
Run 1210, plane0, panel0: Δx , panel frame



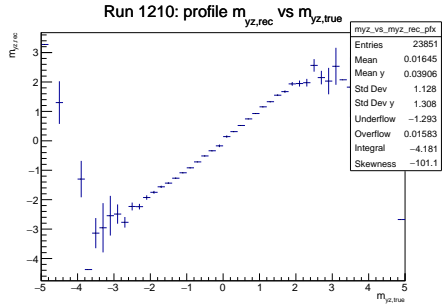
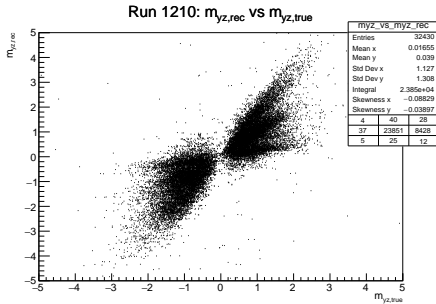
Run 1210, plane0, panel0: Δx vs x



Run 1210, plane0, panel0: profile Δx vs x



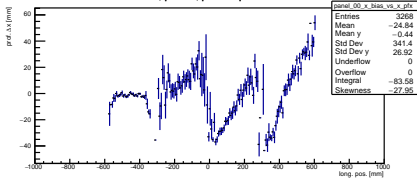
Results



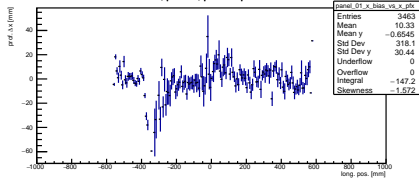
Conclusions

Backup Slide

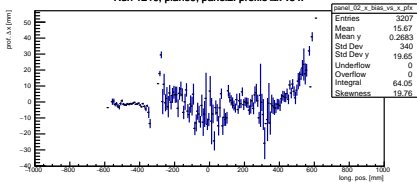
Run 1210, plane0, panel0: profile Δx vs x



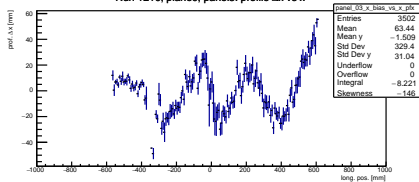
Run 1210, plane0, panel1: profile Δx vs x



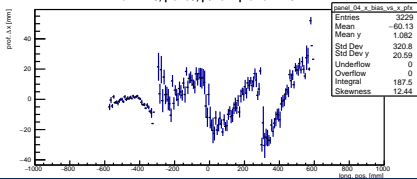
Run 1210, plane0, panel2: profile Δx vs x



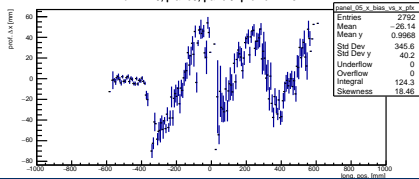
Run 1210, plane0, panel3: profile Δx vs x



Run 1210, plane0, panel4: profile Δx vs x

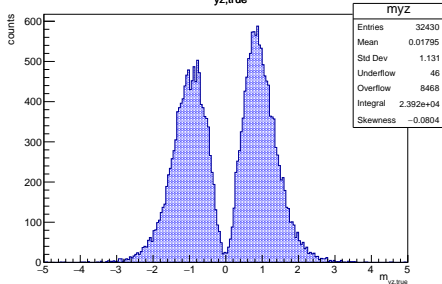


Run 1210, plane0, panel5: profile Δx vs x

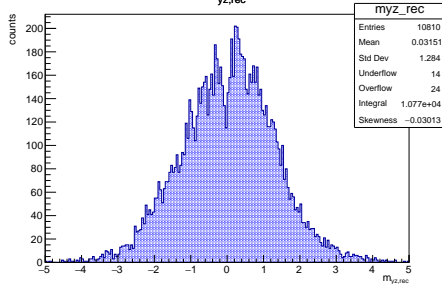


Backup Slide

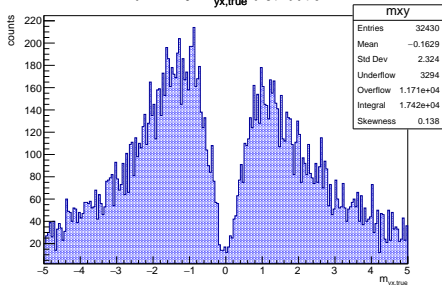
Run 1210: $m_{yz,true}$ distribution



Run 1210: $m_{yz,rec}$ distribution



Run 1210: $m_{yx,true}$ distribution



Run 1210: $m_{yx,rec}$ distribution

