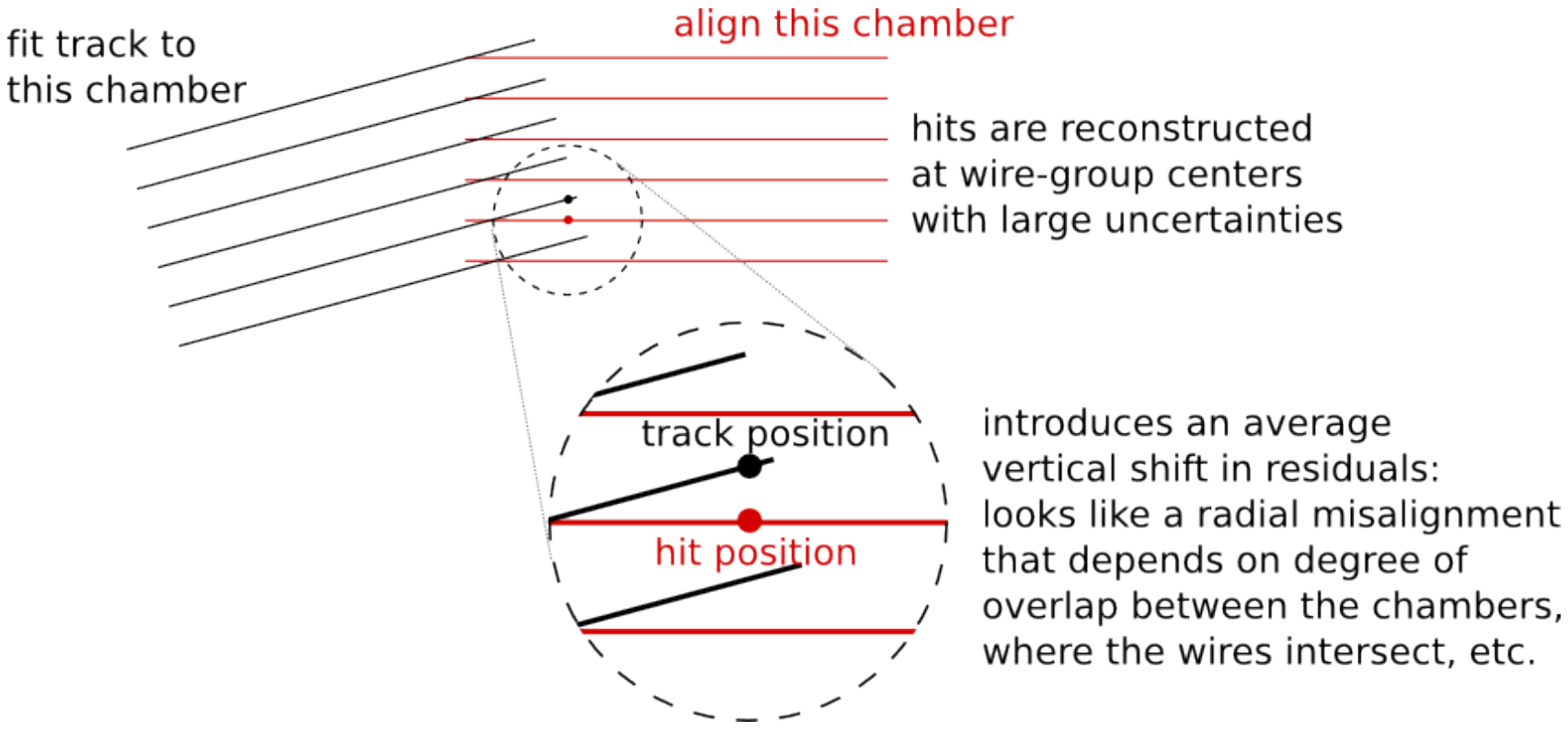
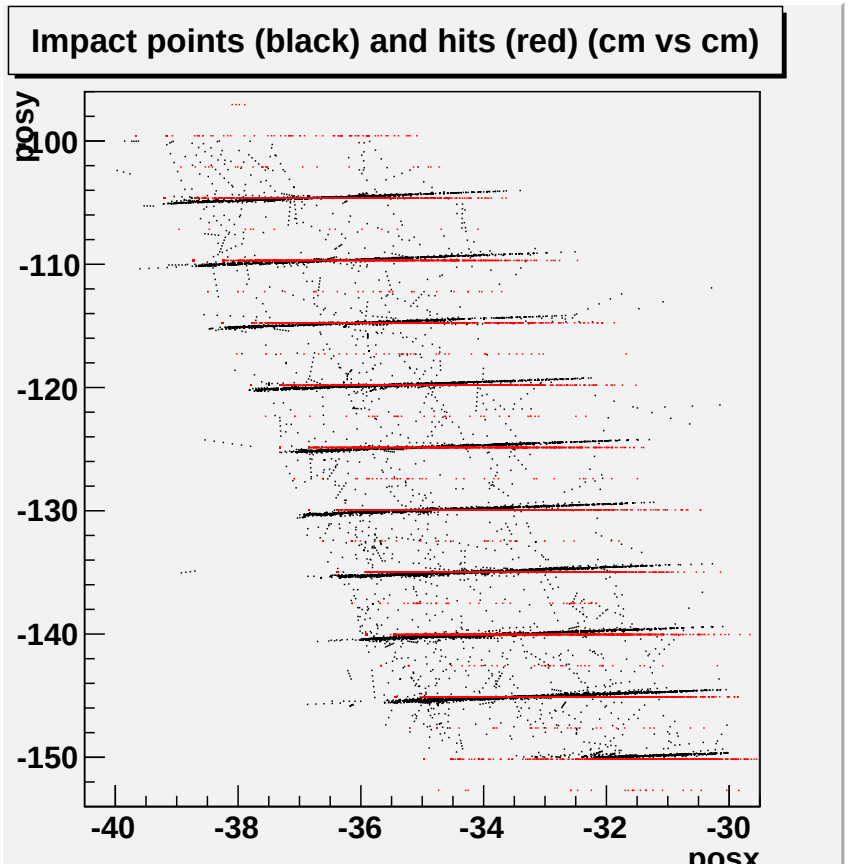
Possible origin of radial shift

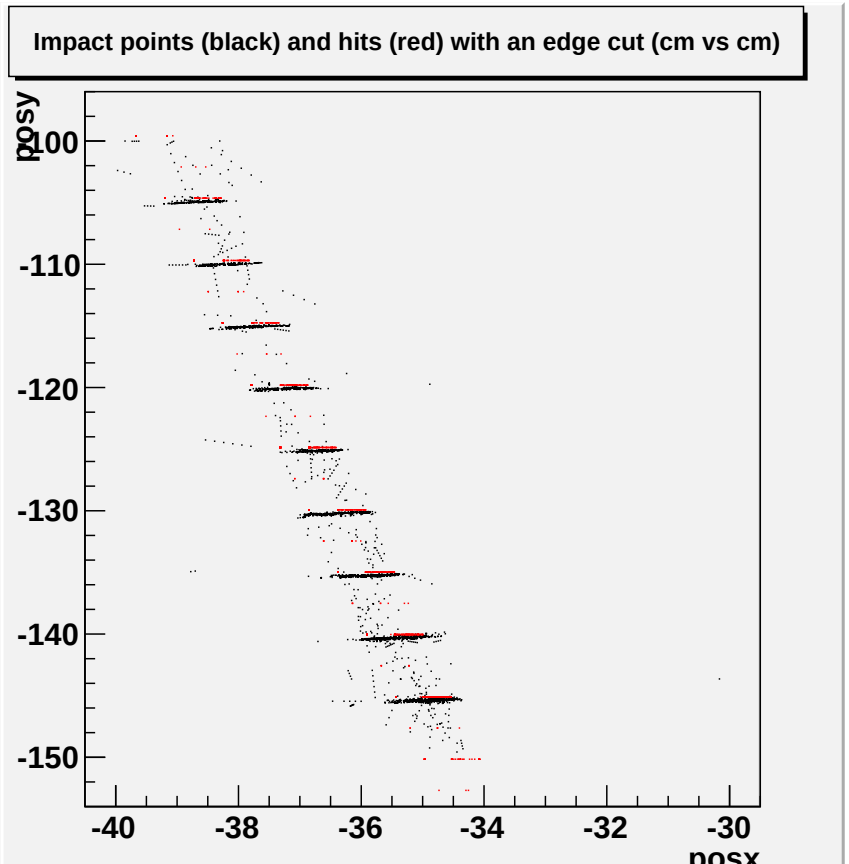


- Effect would be cleanest in beam-halo, where tracks are parallel to the beam and you can see the individual wires
- They're smeared in cosmic ray data, but this bias can still be present in the mean

MC study

- Beam-halo MC, perfect alignment
- Black: track fitted to reference chamber, extrapolated to target chamber
- Red: hit in target chamber
- Wires intersect near the middle of the overlap region, making the average residual zero
- Second plot: apply a cut to change the degree of overlap. (Region of overlap is much larger in data because segment-matching was more inclusive: tracks in MC sample are full standAloneMuons, crossing multiple stations, our CRUZET tracks are pairs of segments)





y-residuals

- First plot: no cut, mean is 50 microns
- Second plot: same cut as previous page, mean is -1.7 mm
- Third plot: cut in the opposite direction, simulating the track-reconstruction used in data, mean is 6.0 mm
- These distributions are much broader in cosmic rays, but might have the same mean-shift