Alignment study with cosmic-ray data

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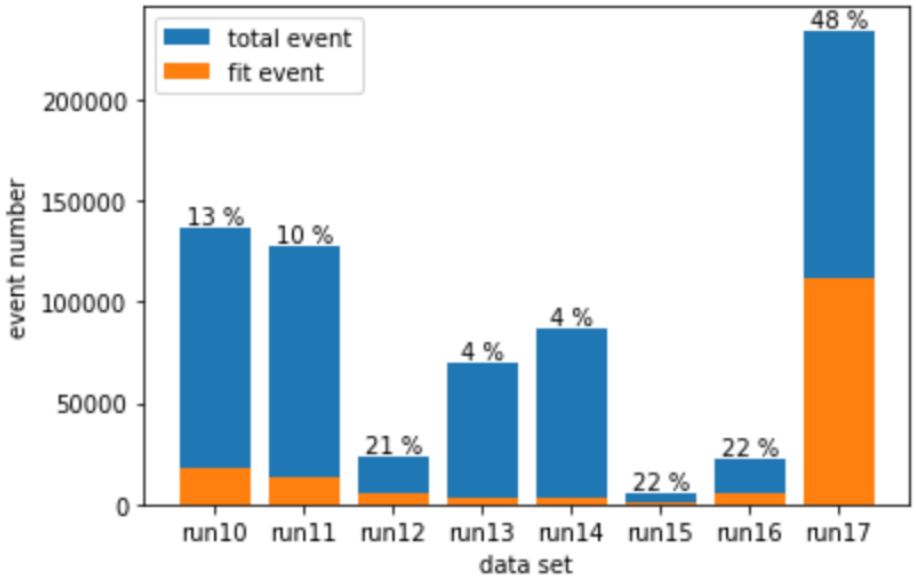
Cgem software meeting

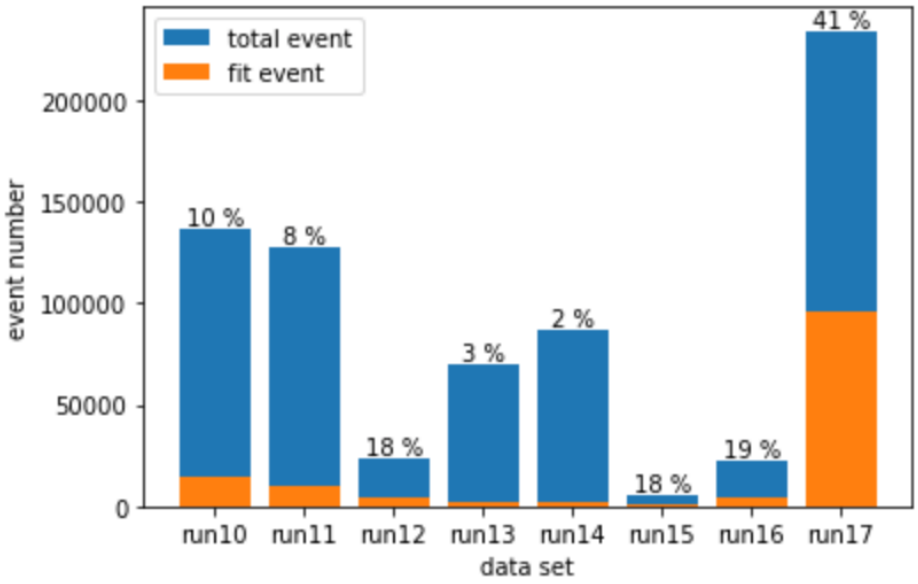
Data set and configuration

- Run10 – run 17
- CgemLineFit:
  - Tag: 00-00-09
  - Method: Loop_maxQ, 3 clusters on each sheet
  - Chisq cut: <300 (wo alignment) <100 (w alignment)
  - Initial parameters: Dx = 0, Dz = 0, Rz = 0
- Strategy
  - Use the fit results from 1st round as the input for 2nd round fit
  - Iterate the procedure until converged

Event usage rate

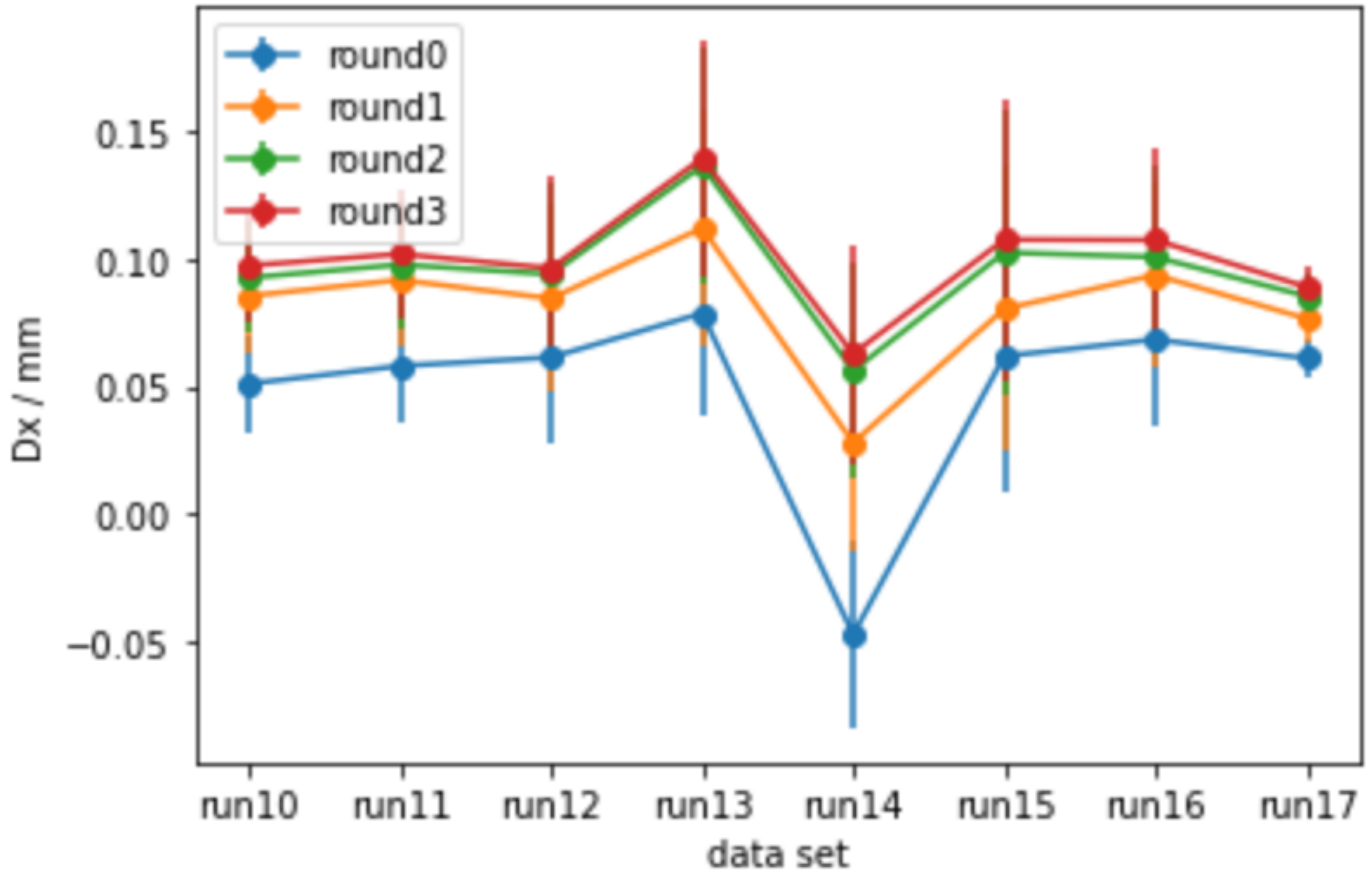


No alignment, $\chi^2 < 300$

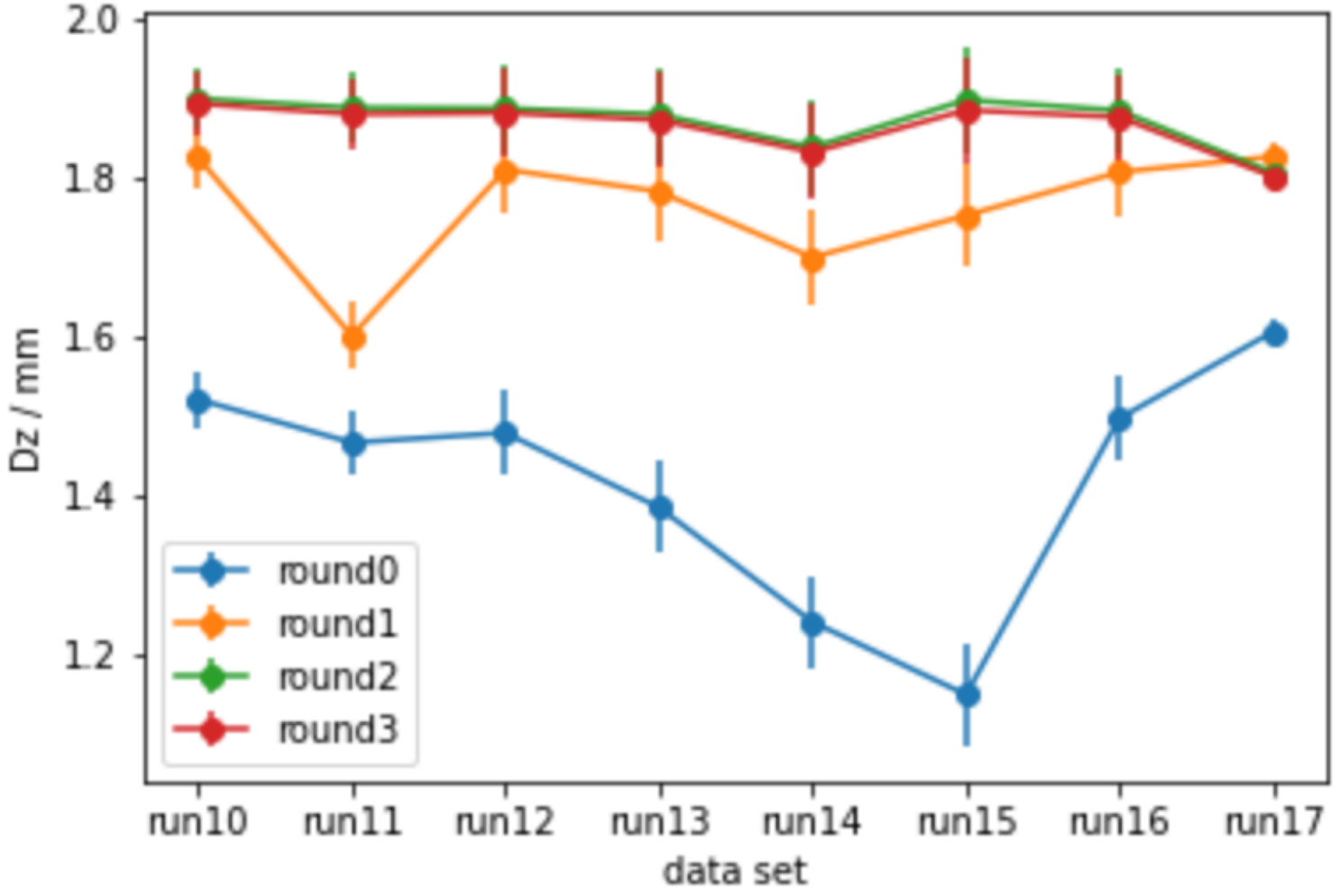


With alignment, $\chi^2 < 100$

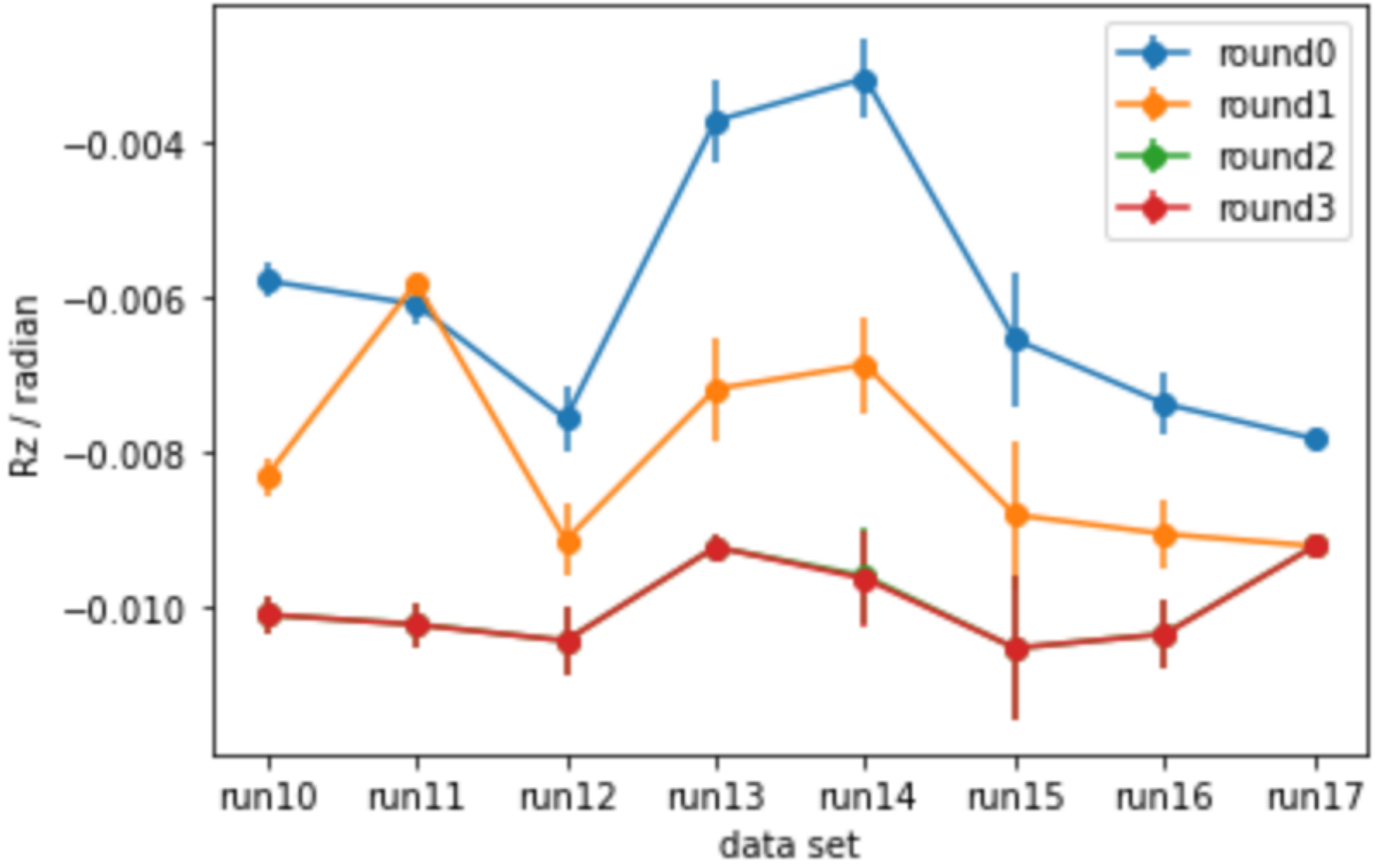
Alignment parameters vs run: Dx



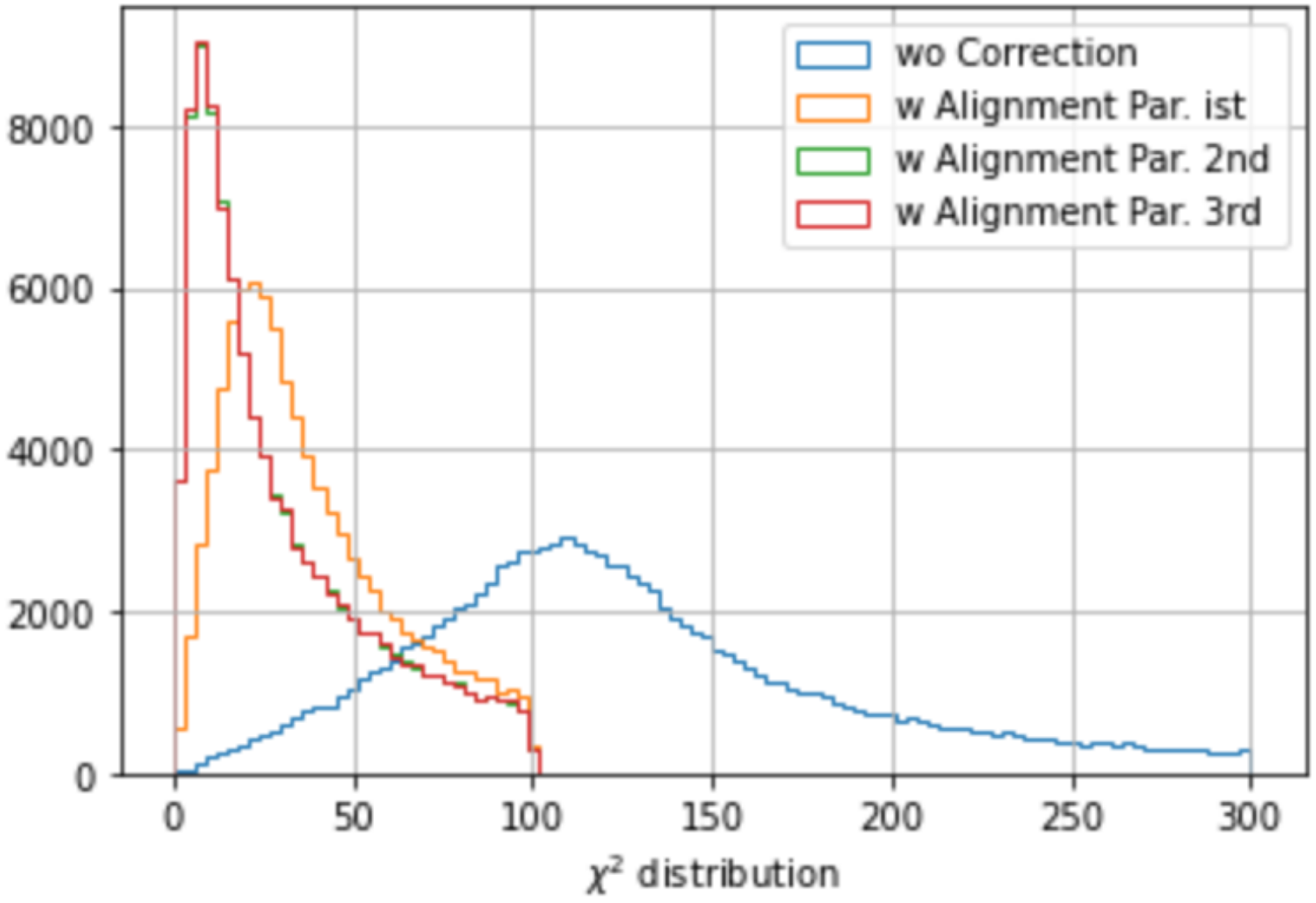
Alignment parameters vs run: Dz



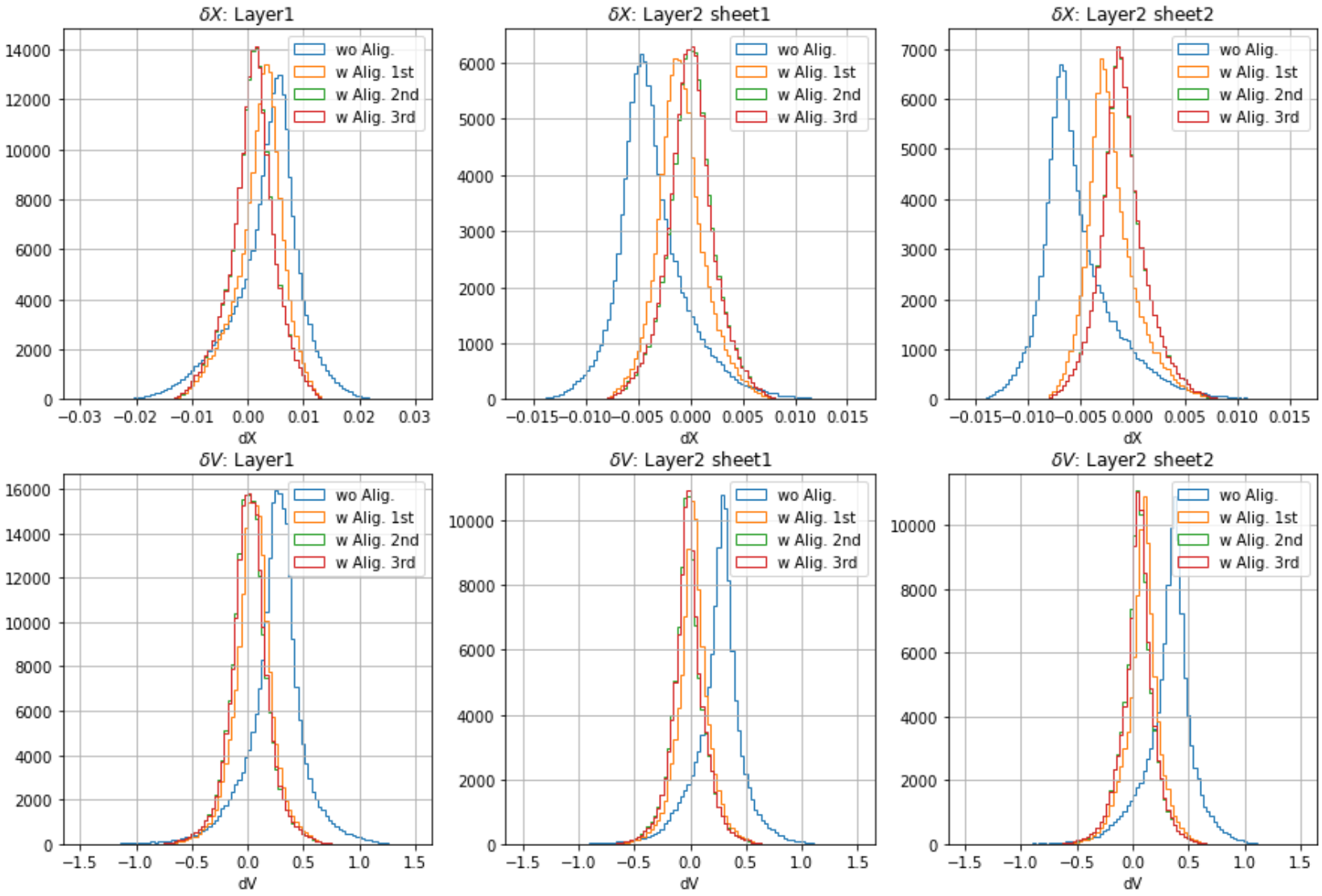
Alignment parameters vs run: Rz



χ^2 distribution

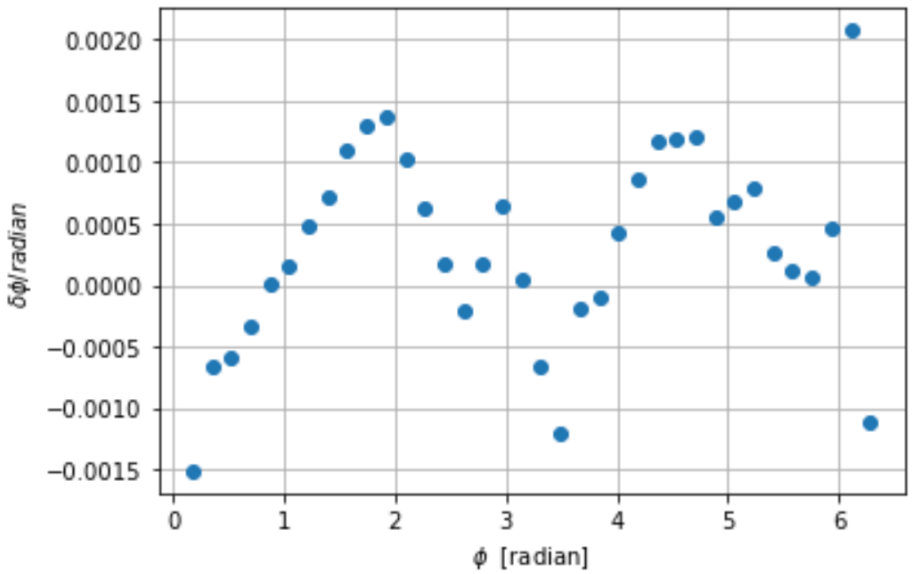


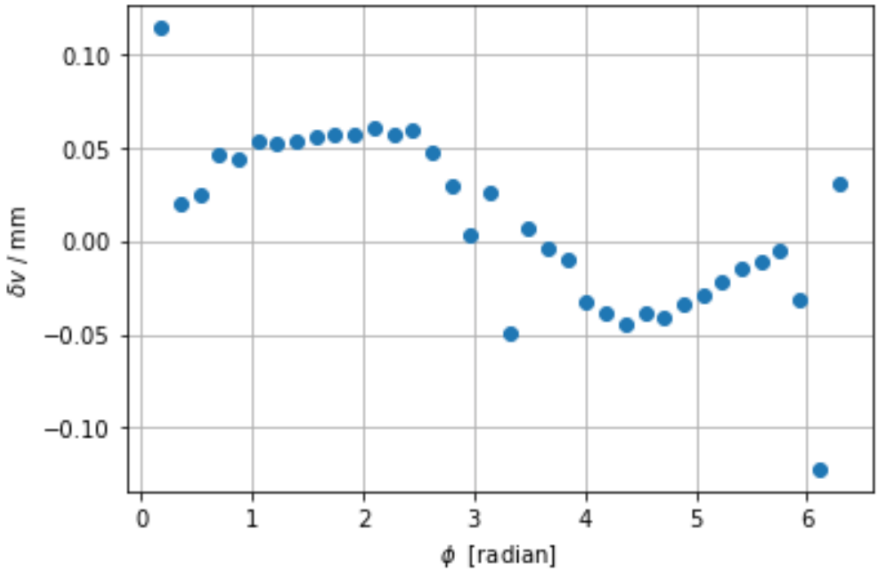
Residual distributions (run17)



Residual vs ϕ

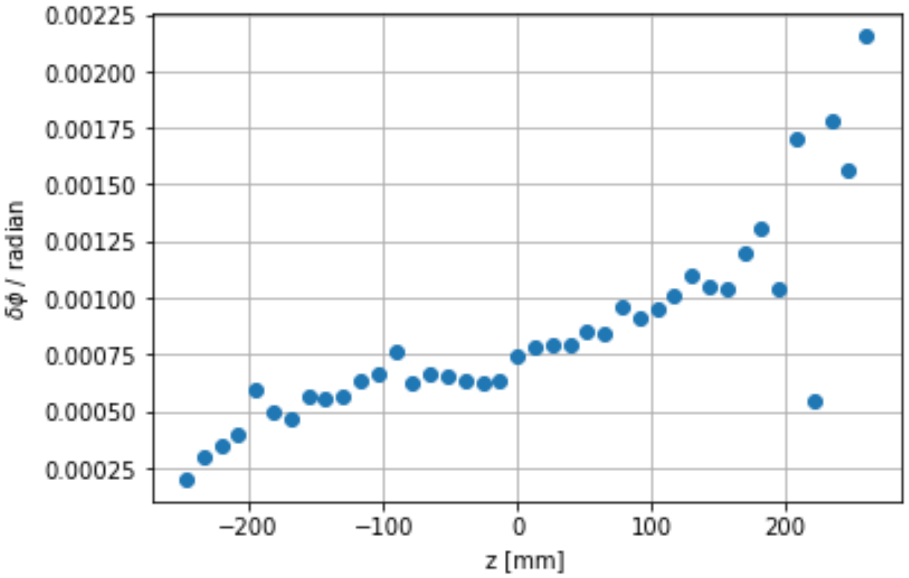
- Run17 layer1

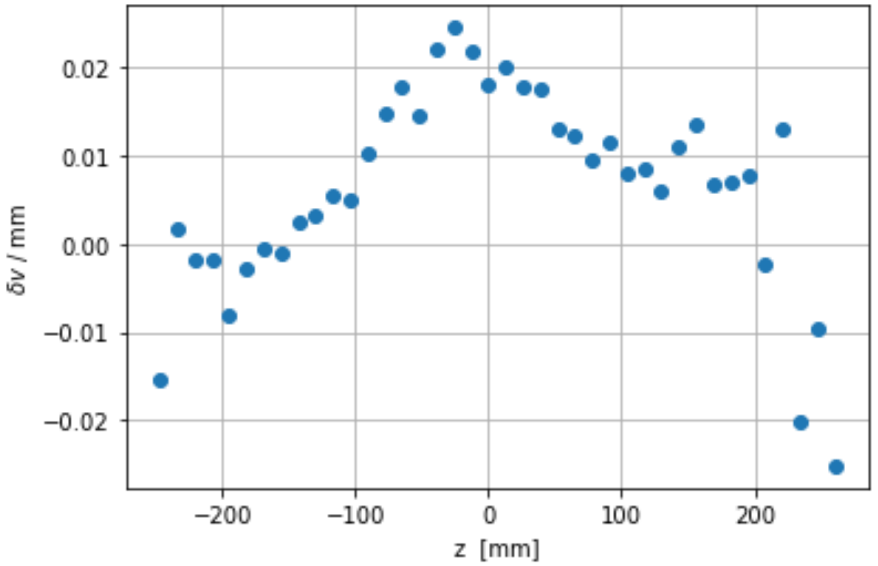




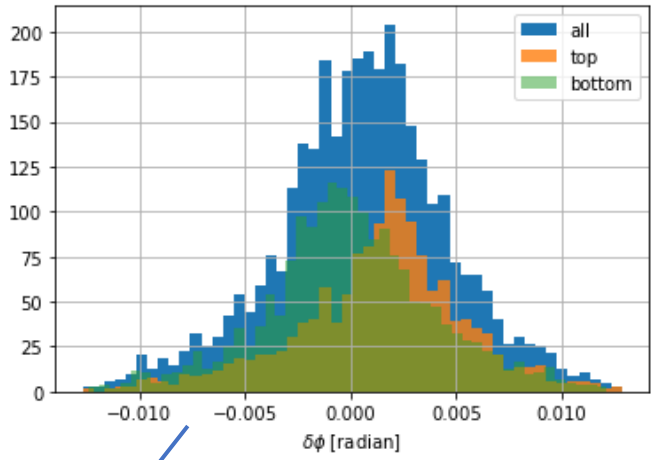
Residual vs Z

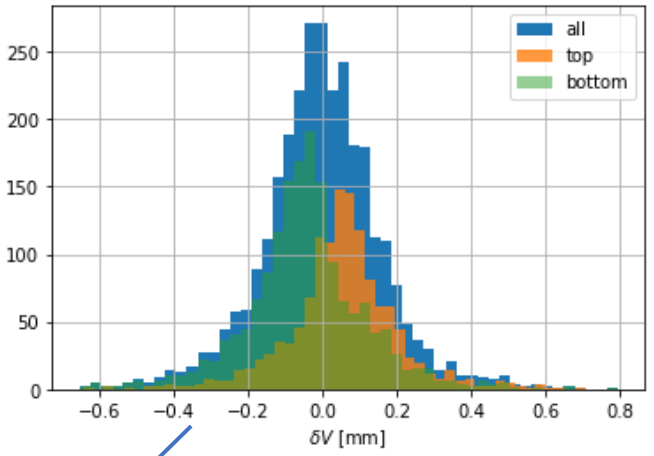
- Run17 layer1

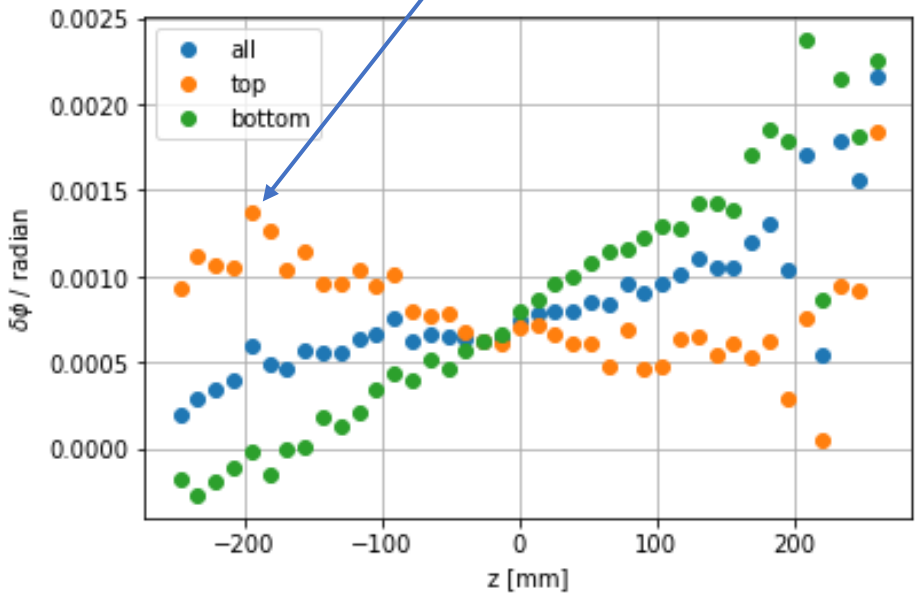


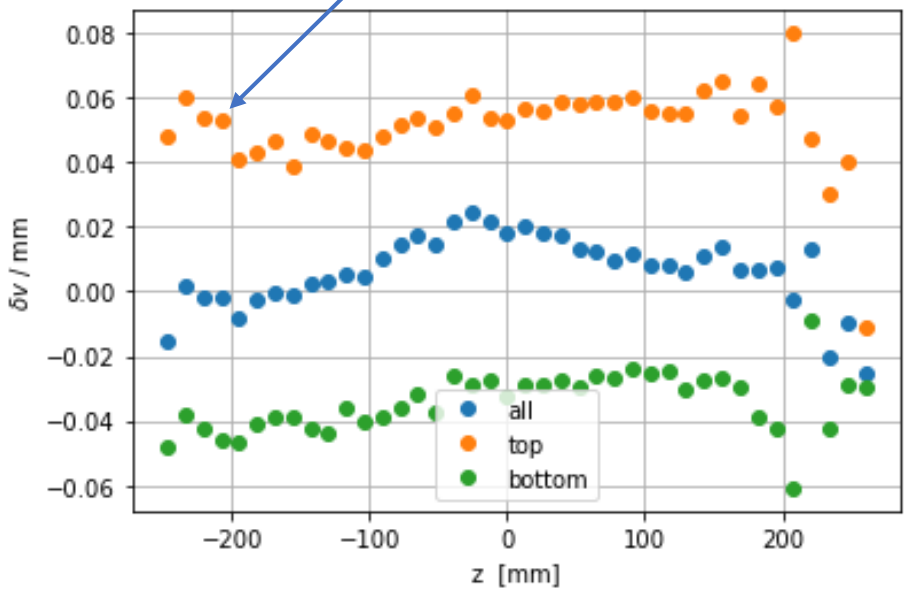


Residual vs Z









Summary

- Study of the alignment is performed based on the cosmic-ray data
- Stable alignment parameters are obtained by 4 times iteration
- Residual distribution is investigated, possible rotation around Y axis is observed

Thank you!

Residual vs ϕ (Z) with std.