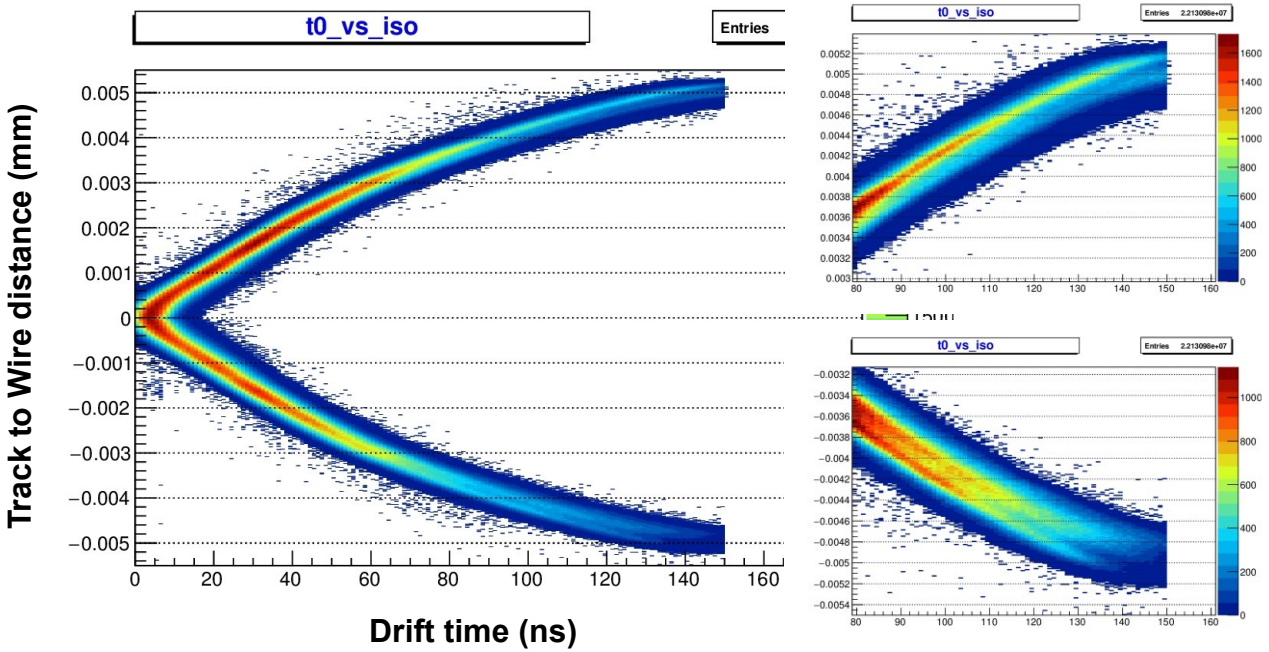
STT System Resolution

- Check time resolution of readout by determination of system resolution
- All steps of readout and analysis included (jitter → calibration → tracking)
- Saw spoiled resolution by imperfect mechanical testframe (sag)
  - Frame introduces straw tube bending
  - Tomography method developed (beam, ^{90}Sr)

- No straw re-alignment during (short) beam time possible
- Recipe how to correct mech. distortion in data developed
- Design system resolution achieved
- Can serve as system failure test (mech. distortions)
- PANDA-STT mech. frame system with better precision (FE-analysis, aso..)

Mech. Distortions in Data (ASIC/TRB)

- Drift time spectra distorted (wire not in tube center)
- Isochrone relation r(t) distorted (~ 100-200µm in data)
- Uncorrected r(t) yields ~ 200-250 µm track resolution
- Staggered layer geometry helps, strong averaging

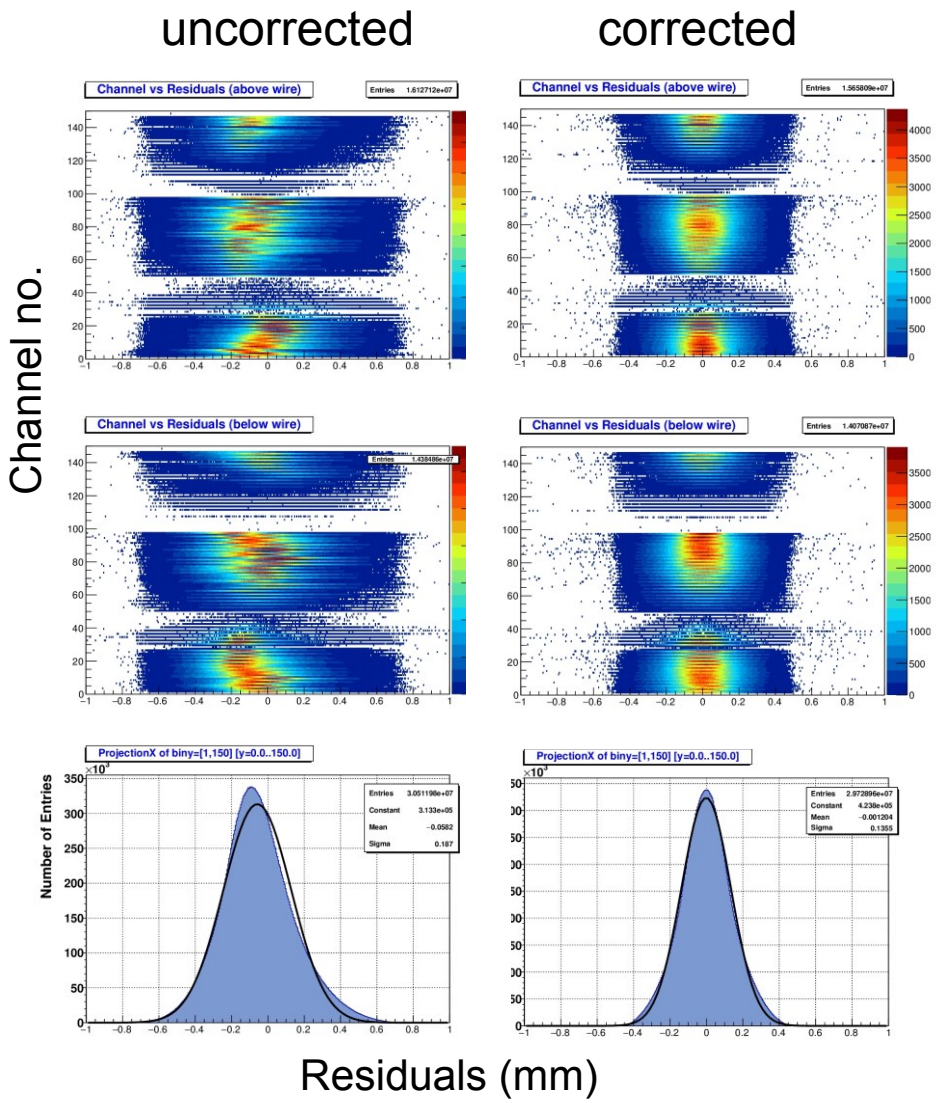


Recipe for Data Correction

- Reconstruct tracks with uncorrected r(t)
- ~200µm track resolution sufficient
- Determine residual shifts
  (track above/below wire)
- Correct r(t) by avg. residual shifts
- Add R_0 to r(t), above/below wire
- Re-fit, iteration of shifts

- Uncorr.: σ = 187µm, mean= -58µm
- Corr: σ = 135 µm, mean = -1µm

- Global r(t) used
- R_0 shifts for individual channel
- Individual wire positioning not necess.



ASIC/TRB Spatial & ToT Resolution

- Results here for ASIC/TRB readout (analysis by Peter)
- Full dE/dx range covered: ~ 5-50 keV/cm
- Results for deuteron testbeams & cosmic data-taking

- Spat. resolution in range σ = 130 – 142 µm (biased!)
- Design goal (150µm) reached
- ToT separation power demonstrated
- PASTTREC-ASIC verified