Update on UVa GEMs: Spatial Resolution Studies

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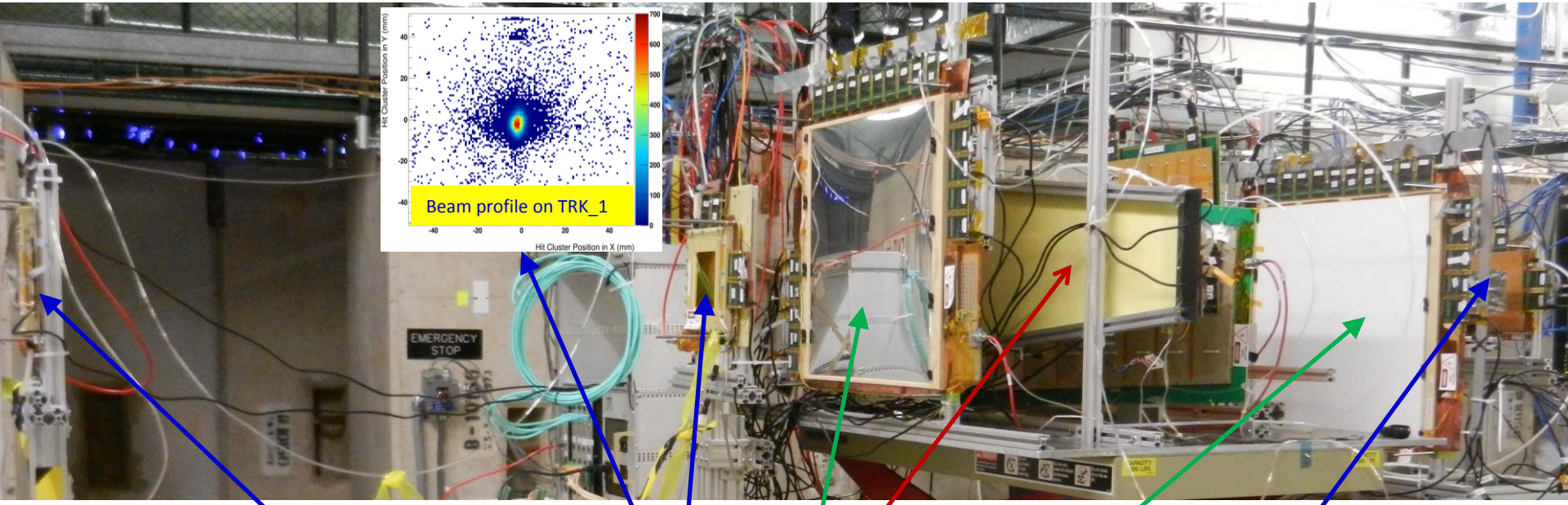
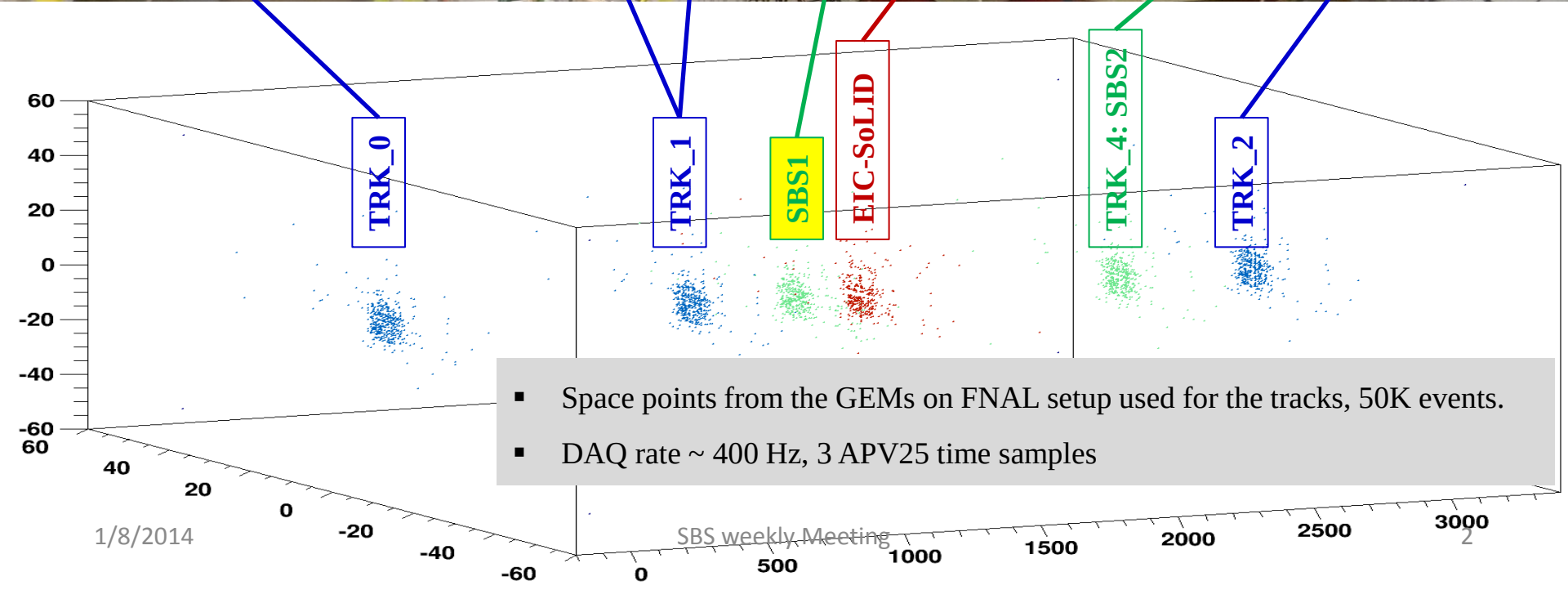
UVa GEMs @ FNAL Test Beam: 120 GeV Proton Beam

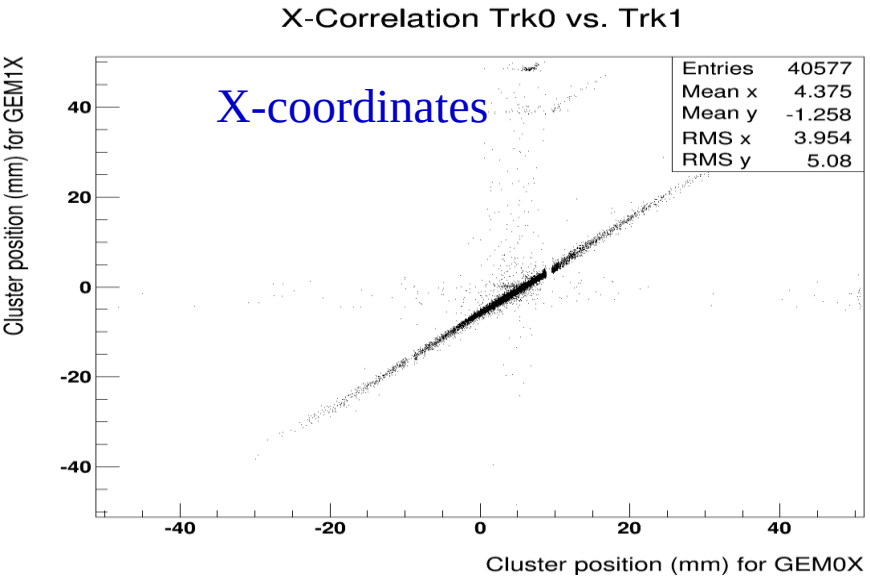


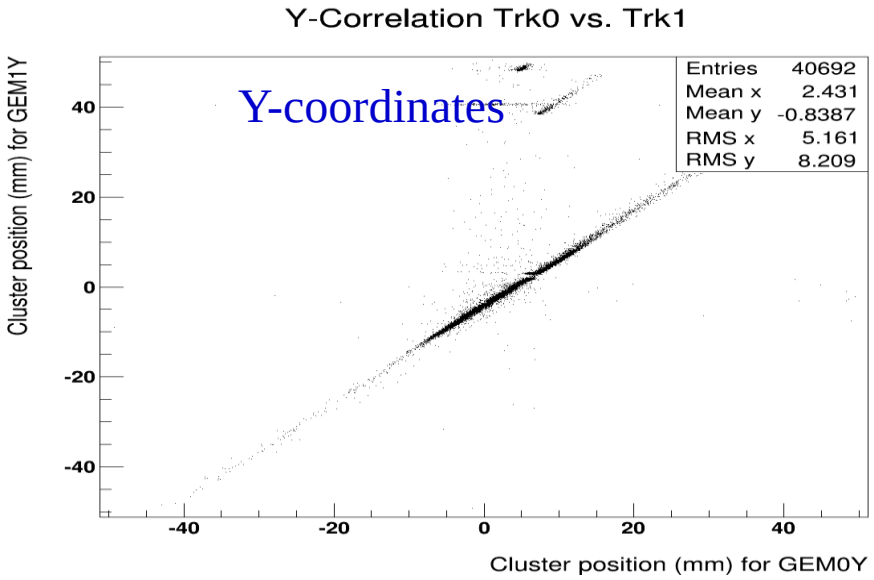


- Space points from the GEMs on FNAL setup used for the tracks, 50K events.
- DAQ rate ~ 400 Hz, 3 APV25 time samples

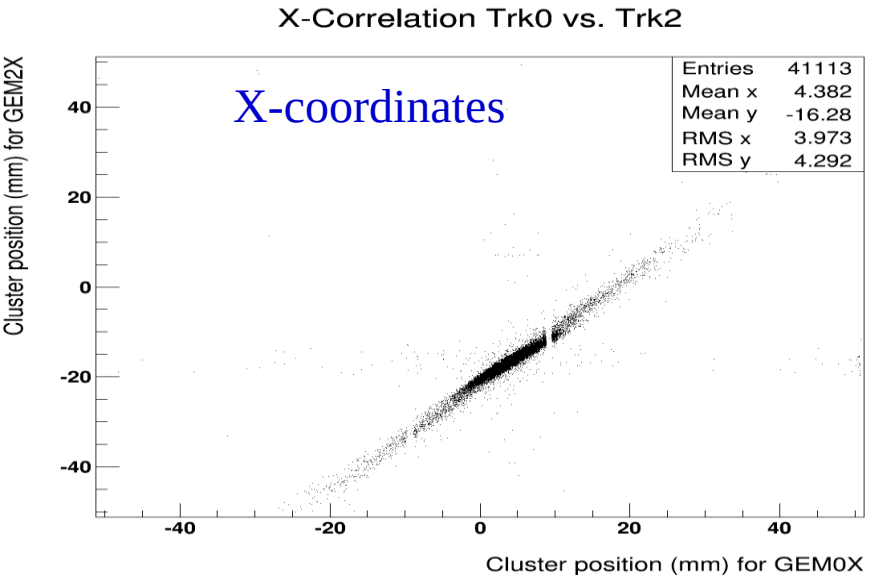
Position correlation of the Trackers

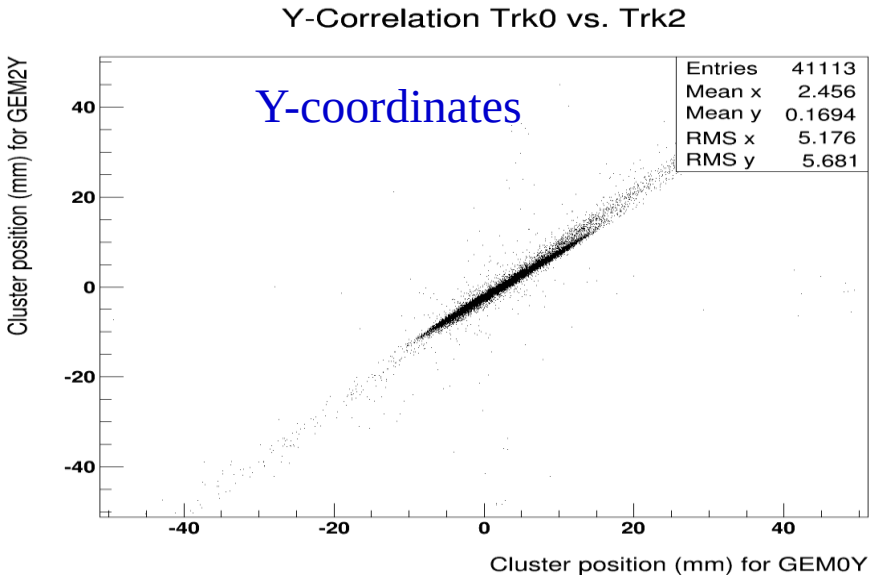
Tracker0 vs. Tracker1





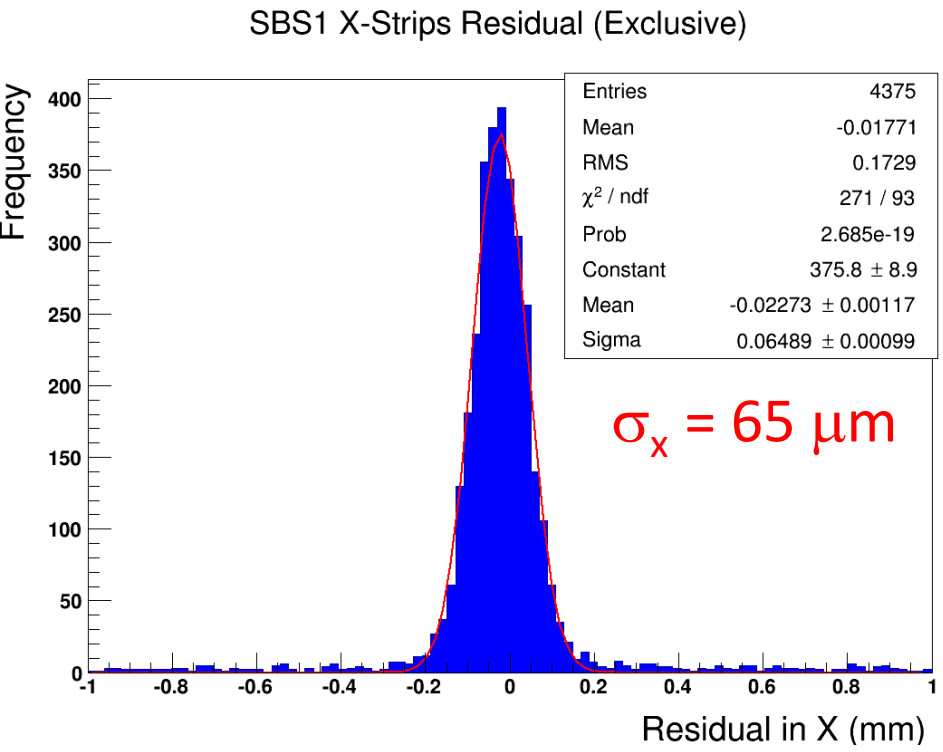
Tracker0 vs. Tracker2

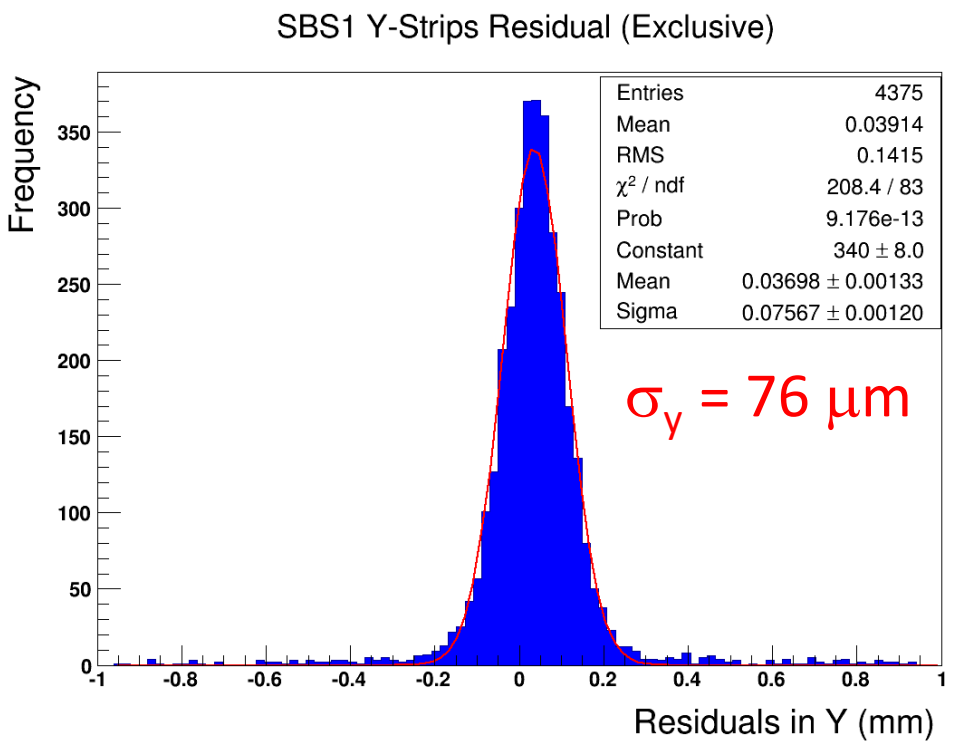




Tracking and Residuals: Exclusive SBS1

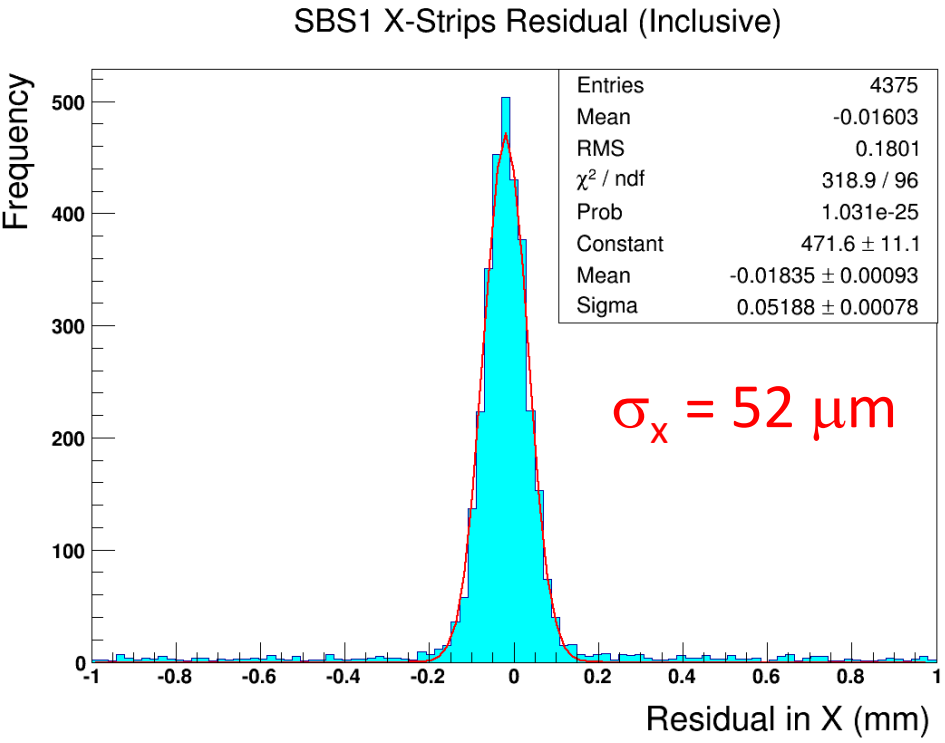
- Good event: single hit in each X and Y direction for all 4 Trackers (3 samll GEMs and SBS2)
- Tracking: Linear fit in X and Y using the single hit from the 4 trackers ➔ SBS1 data excluded
- Residual distribution: $(X_{SBS1} - X_{track})$ and $(Y_{SBS1} - Y_{track})$

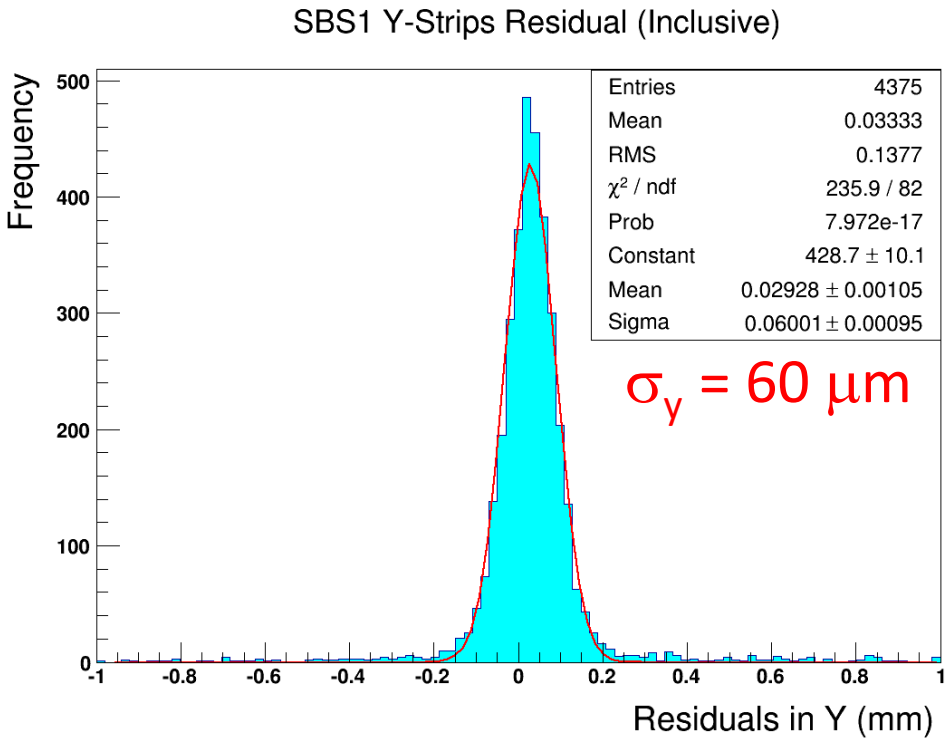




Tracking and Residuals: Inclusive SBS1

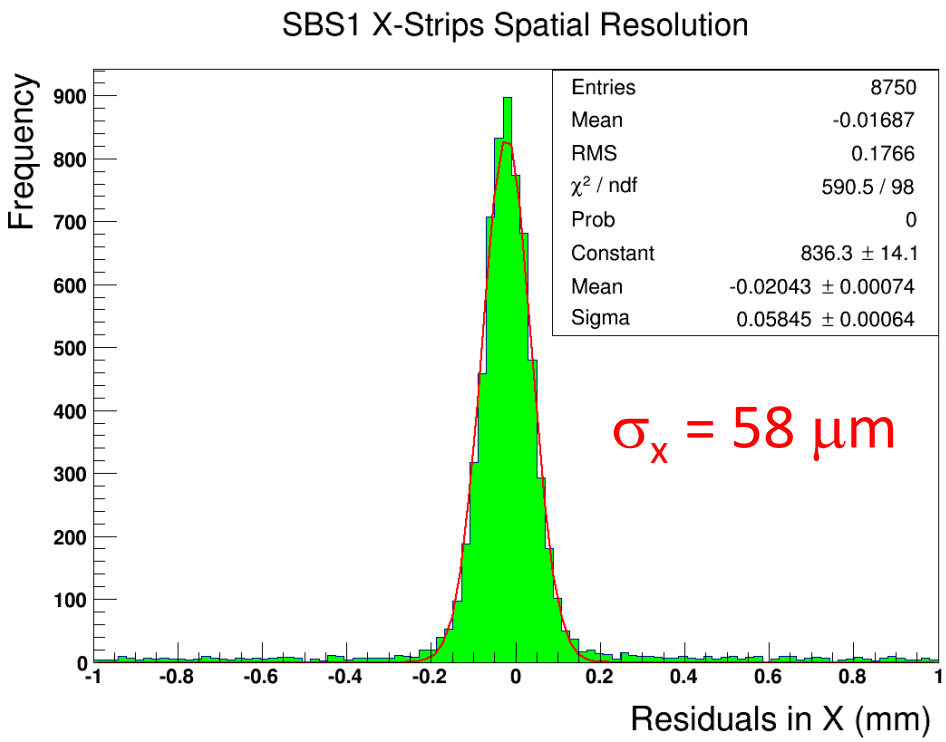
- Good event: single hit in each X and Y direction for all 4 Trackers (3 samll GEMs and SBS2)
- Tracking: Linear fit in X and Y using the single hit from the 4 trackers as well as SBS1hit ➔ inclusive SBS1.
- Residual distribution: $(X_{SBS1} - X_{track})$ and $(Y_{SBS1} - Y_{track})$

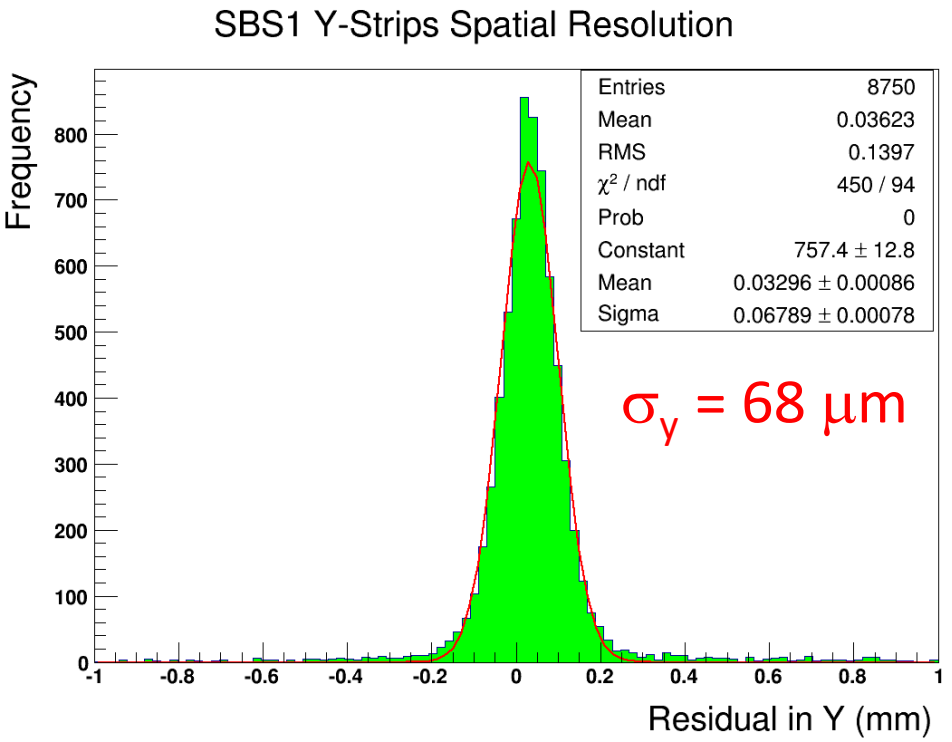




Spatial Resolution of SBS1

- Combined distribution : Exclusive and Inclusive residual distribution are merged
- Resolution: Width ($\sigma_{resolution}$) of the Gaussian fit to the combined residual distribution
- Resolution: $\sigma_{resolution} = sqrt\ (\sigma_{exclusive} \times \sigma_{inclusive})$





Status of the construction SBS3 (60×50 cm^2)

- SBS3 assembly was completed in clean room before Christmas break
- We are currently finalizing the assembly
  - Final test of the HV sectors
  - Mounting of the HV divider with the protective resistors.
- We expect to put the chamber on Ar/CO2 later today
- Tomorrow we want to apply the HV and look at the signal from the chamber