COT Studies

Chris Hays, Duke University

Simulation Meeting

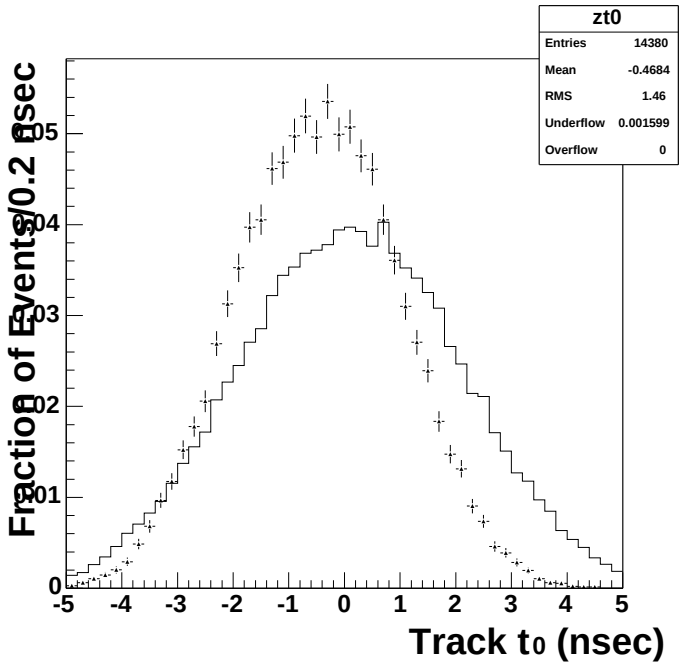
March 25, 2004

- MC tuning
  - Hit, vertex resolution
  - Hit widths, efficiencies
- Vertex t_0 studies

Hit and Vertex Resolution

t_0 spread incorrect in MC

- 2 ns in Z MC vs ∼1.5 ns spread in Z data



tcl switch to get right t_0 in MC

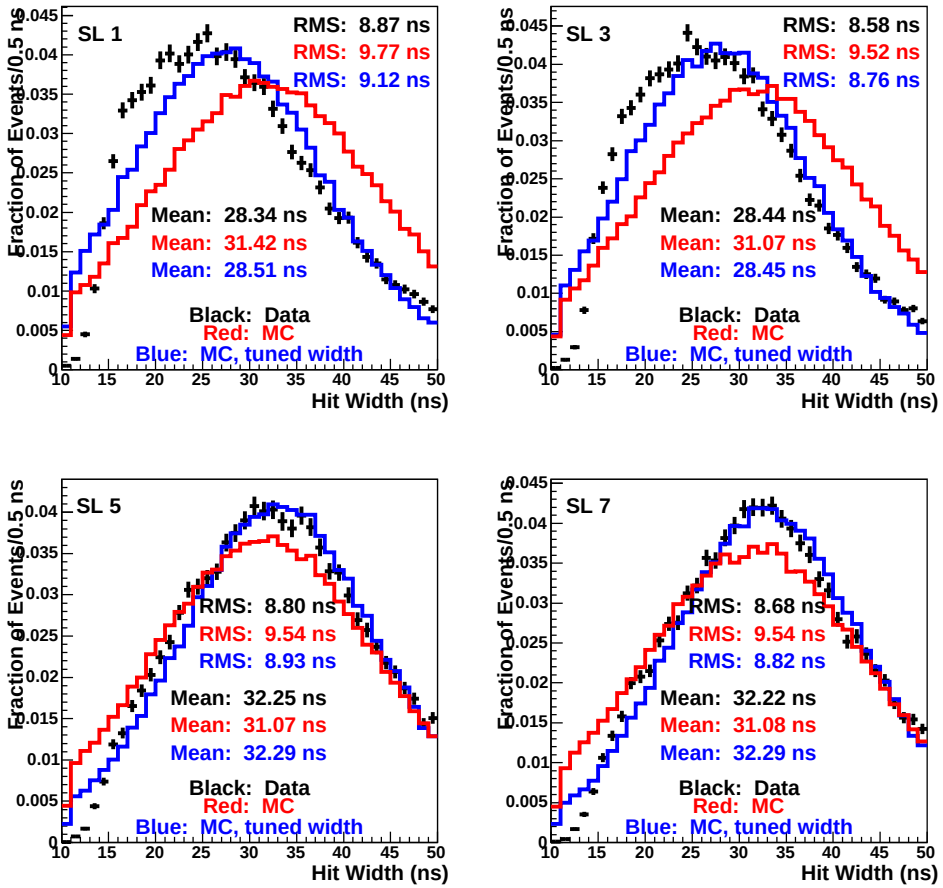
Affects scaling of COT hit resolution – scale goes from 0.4 to 0.5

Hit Widths

Hit widths not well modeled by Garfield simulation

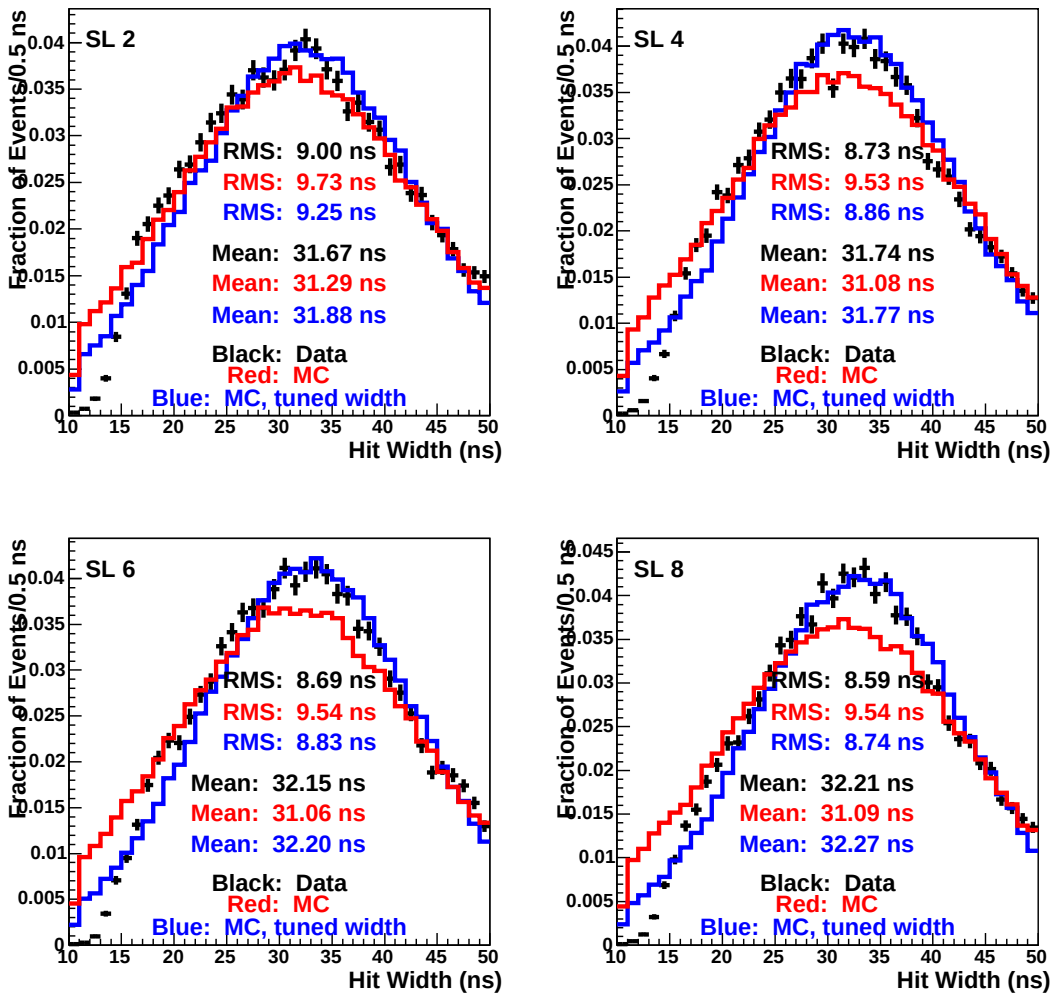
- Proper modeling could improve simulation of hit inefficiency
- Remove hits that fall below a hit width threshold

Scale mean and sigma of hit widths for stereo superlayers:



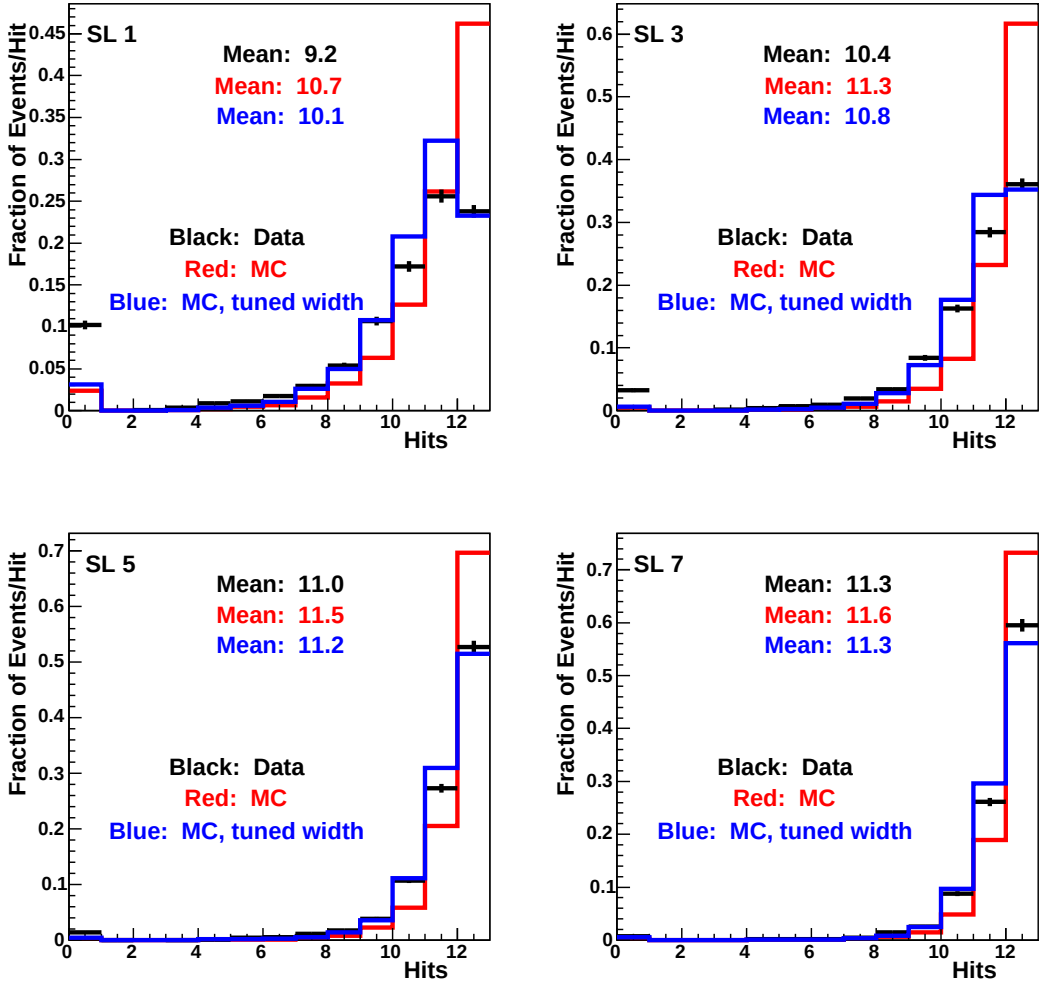
Hit Widths

Scale mean and sigma of hit widths for axial superlayers:



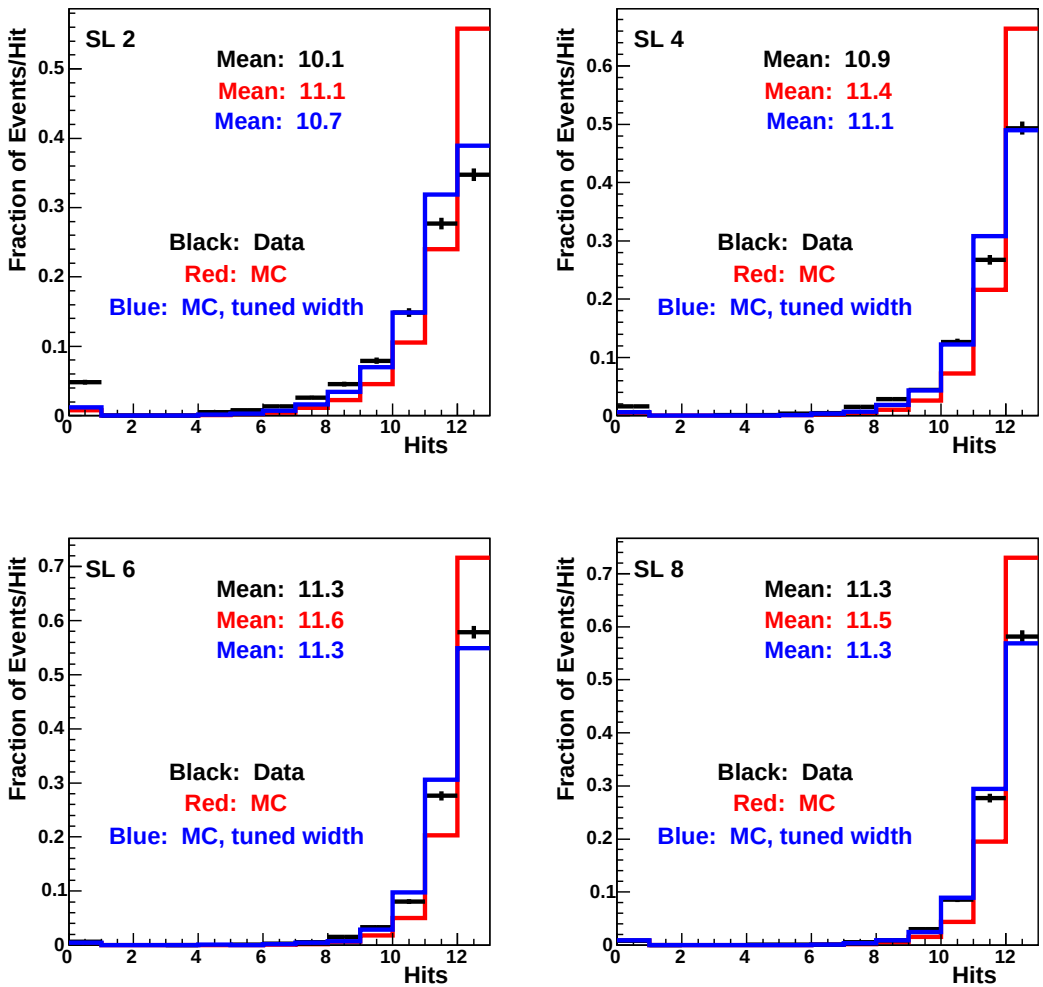
Hit Efficiencies

After width scaling and removing hits with widths below 10 ns:



Hit Efficiencies

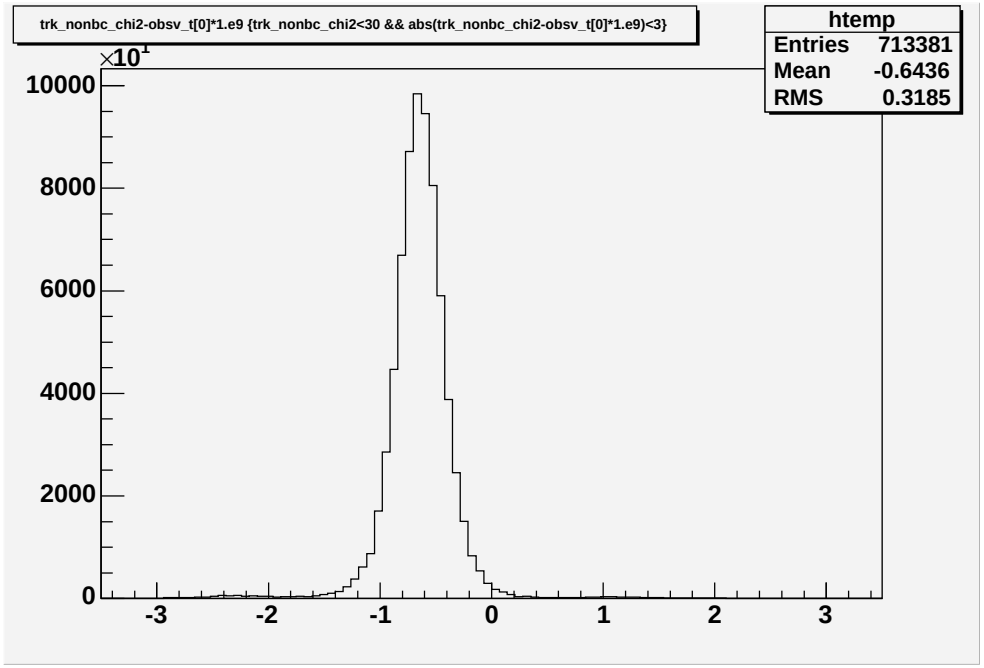
After width scaling and removing hits with widths below 10 ns:



Vertex t_0

Vertex t_0 constraint committed to development

Comparison of constrained t0 to MC t0:



Offset could be due to:

- Incorrect t_0 calibration for MC
- Low β tracks pulling t_0 fit

Conclusions

Resolution, hit width, efficiency improvements

- t_0 width matched to data
- Hit widths scaled by superlayer
- Hit usage distributions match better
- Hit efficiency per superlayer tcl available

Issues remaining

- Understand t_0 offset in MC
- Finalize hit width tuning