Run Dependence of COT Hit Quantities

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- Hit Usage
- Hit Residual
- Hit Width
- Conclusions

Samples

- Data Sample
  - Good runs for CMUP and CMX (206.8 ± 12.0 pb^{-1}), standard muon selection
  - $W \to \mu\nu$ data and cosmic muons
- Split data into 8 run ranges:
  - 138425-149703: 27.4 pb^{-1}
  - 150798-153987: 32.6 pb^{-1}
  - 154653-156487: 40.4 pb^{-1}
  - 158644-161792: 33.4 pb^{-1}
  - 161795-163464: 27.9 pb^{-1}
  - 163474-165435: 22.4 pb^{-1}
  - 165436-167261: 31.7 pb^{-1}
  - 167266-168889: 21.9 pb^{-1}
- Study quantities by superlayer

W Hit Usage

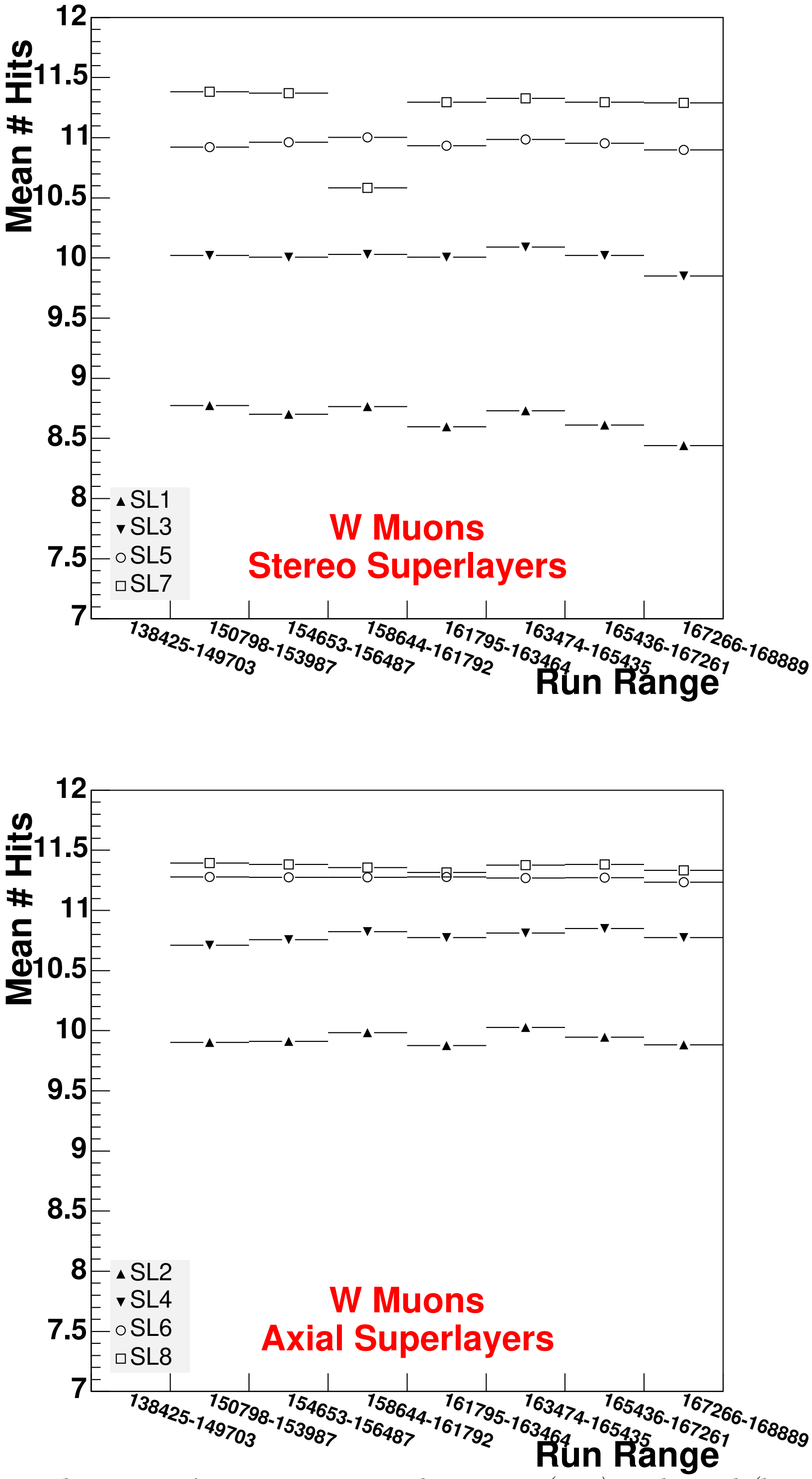
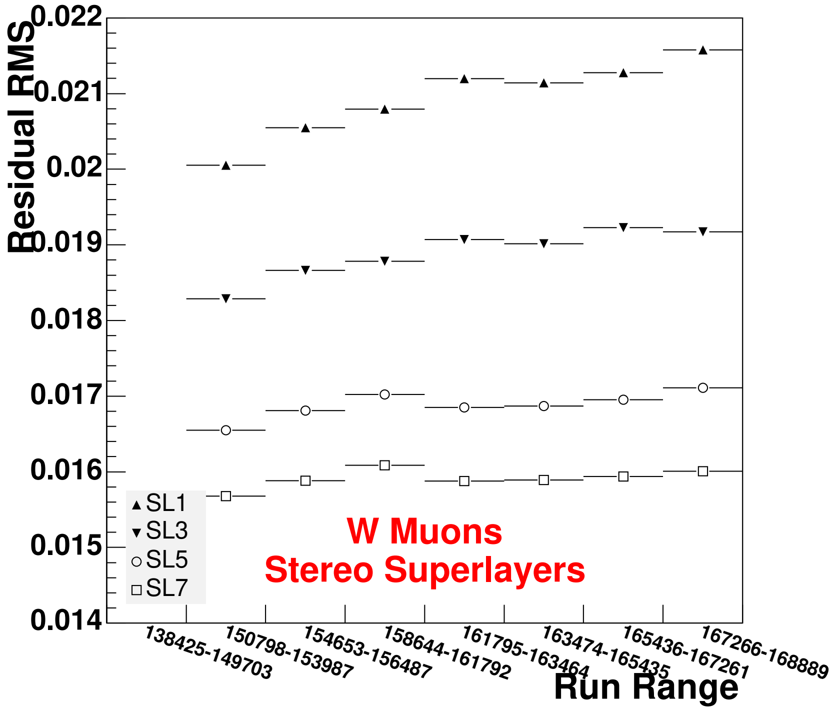


Figure 1: *The mean hit usage for W muons in the stereo (top) and axial (bottom) superlayers.*

W Hit Residual



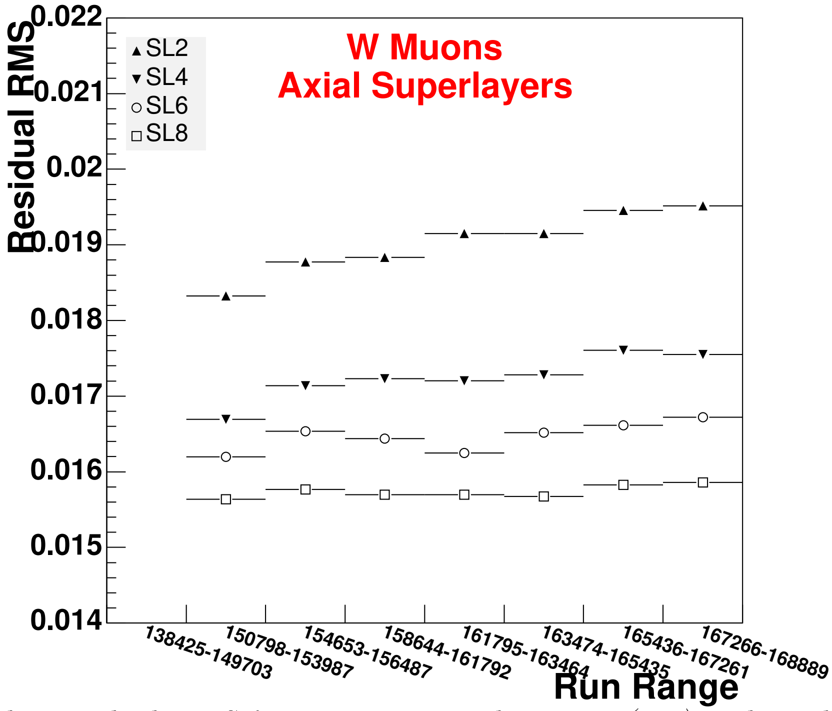
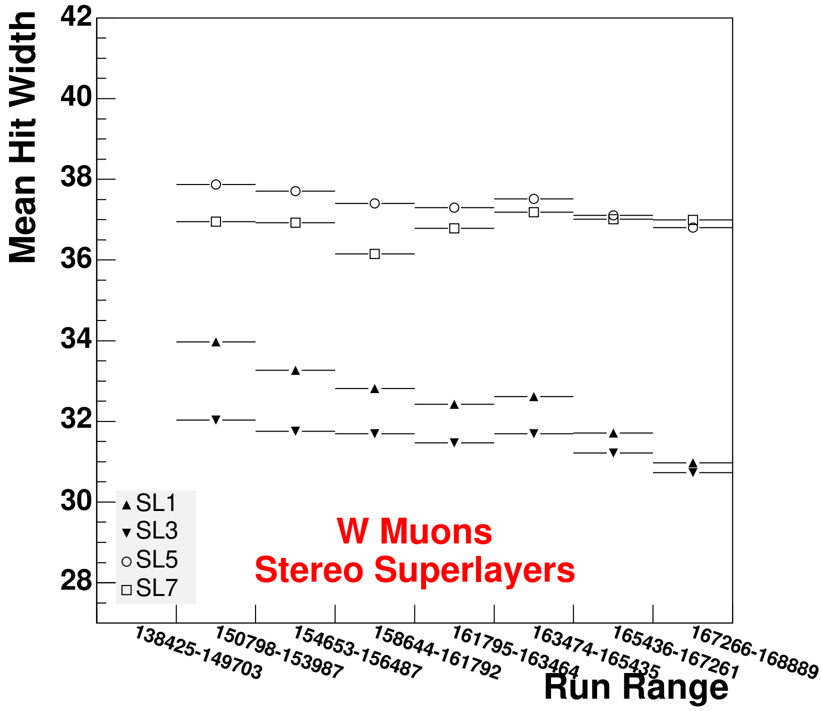


Figure 2: *The hit residual RMS for W muons in the stereo (top) and axial (bottom) superlayers.*

W Hit Width



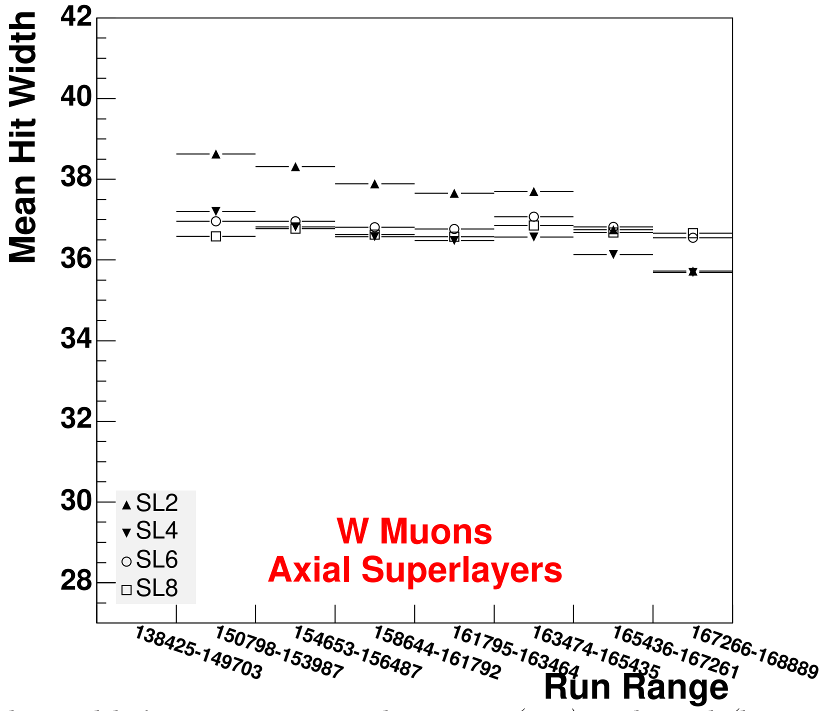
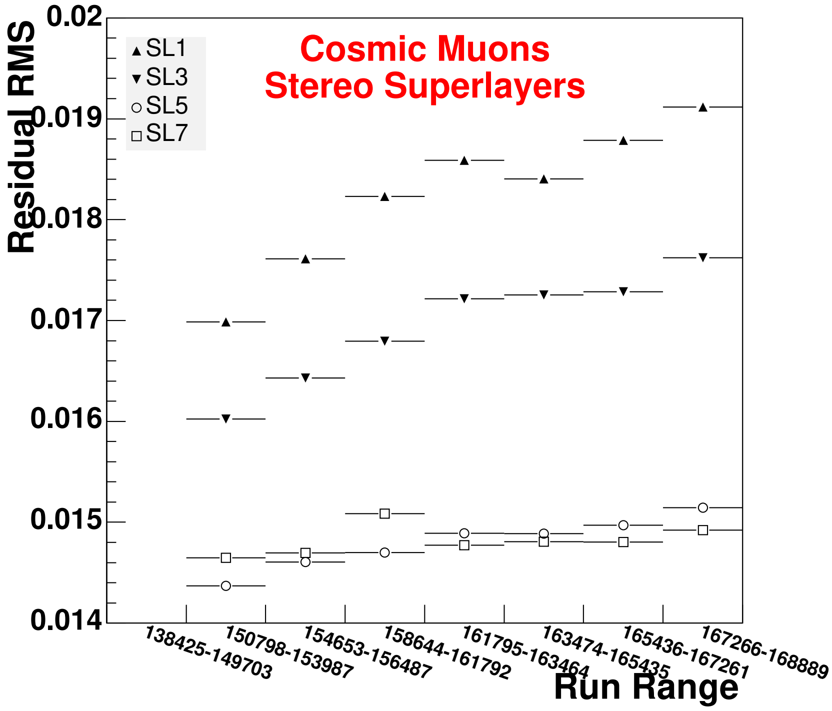


Figure 3: *The hit width for W muons in the stereo (top) and axial (bottom) superlayers.*

Cosmic Hit Residual



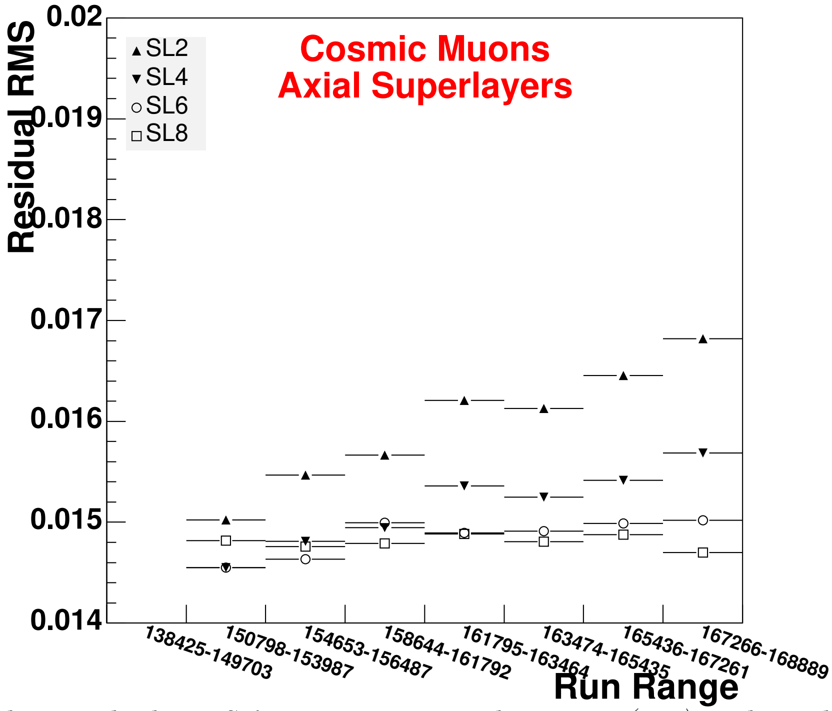


Figure 4: *The hit residual RMS for W muons in the stereo (top) and axial (bottom) superlayers.*

Cosmic Hit Width

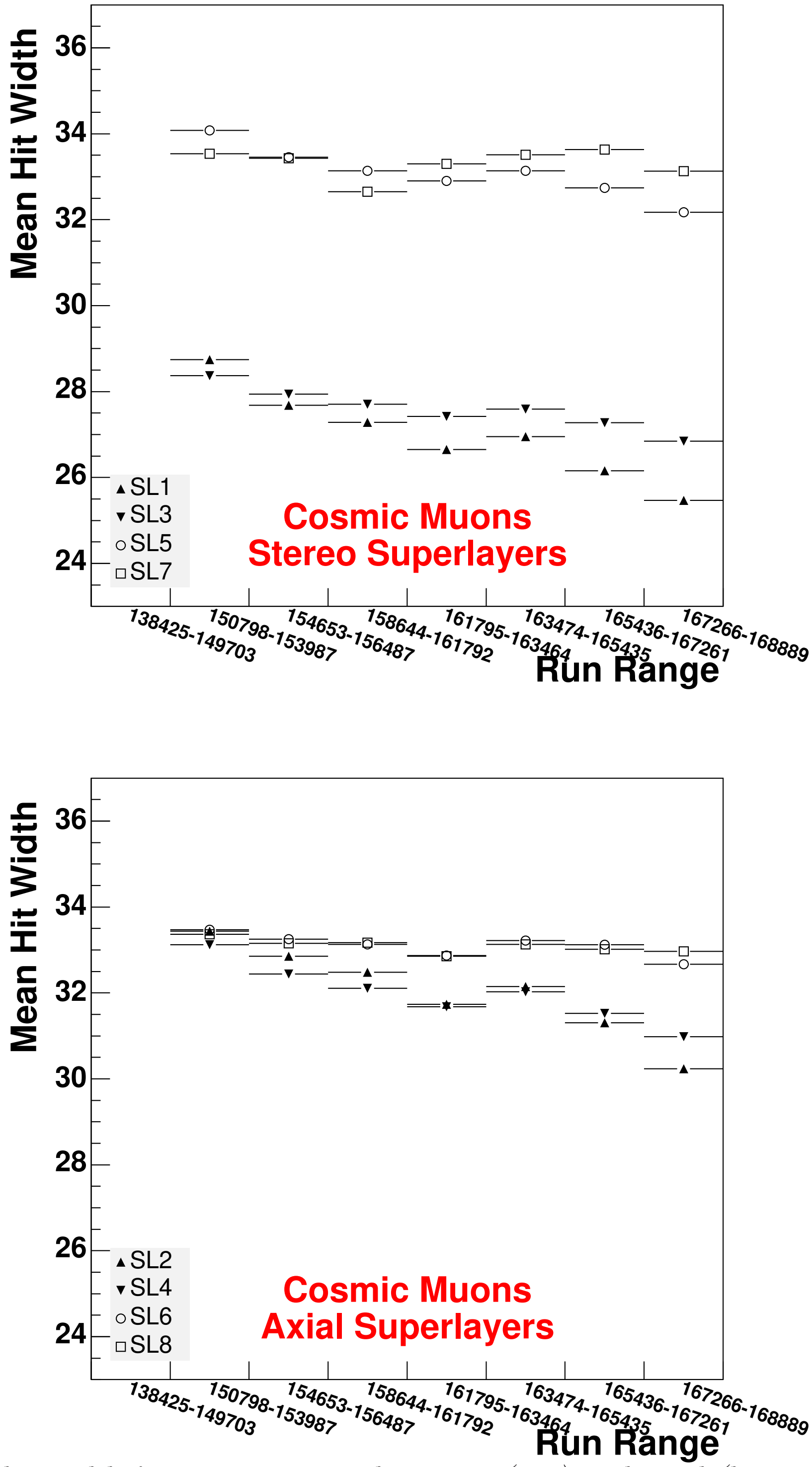


Figure 5: *The hit width for W muons in the stereo (top) and axial (bottom) superlayers.*

Conclusions

- COT aging effects
  - Hit widths decreasing with time
  - Resolution worsening with time
  - Hit usage decreasing with time
  - Inner superlayers show largest effects
- Not due to increasing instantaneous luminosity
  - Resolution worsens due to overlapping hits
  - Expect hit widths to increase for worse resolution