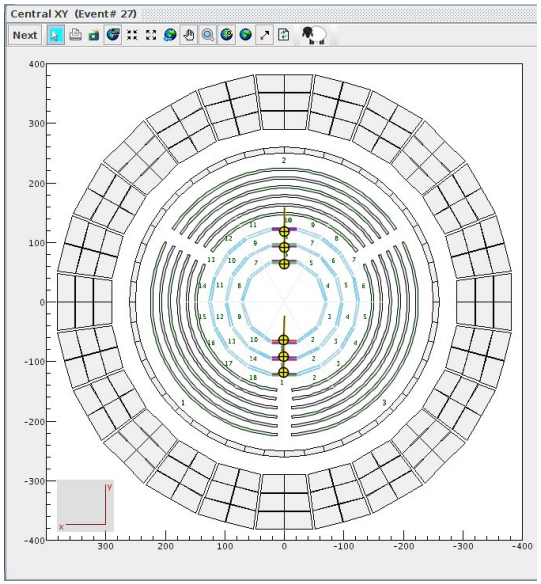
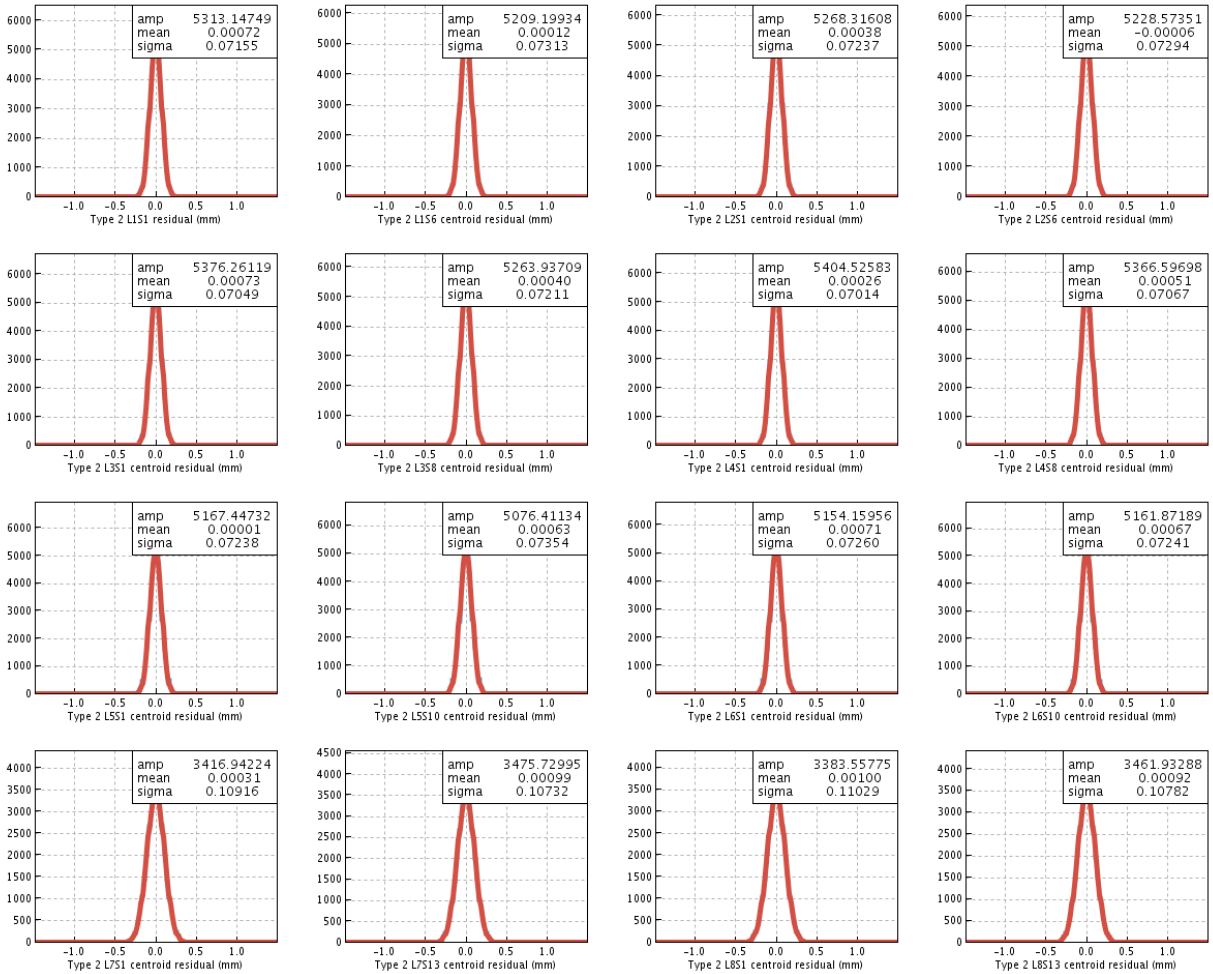
SVT Track-Based Alignment - "The Good"

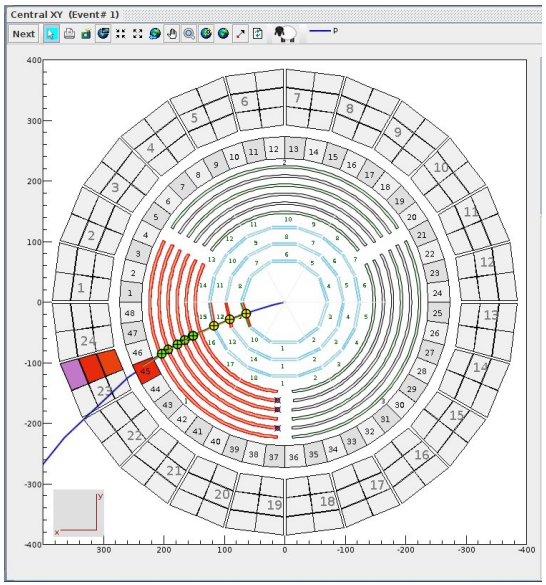
Early results with simulated, type-1, cosmic events (see below) with ideal geometry in simulation show residuals close to zero and widths near specifications.

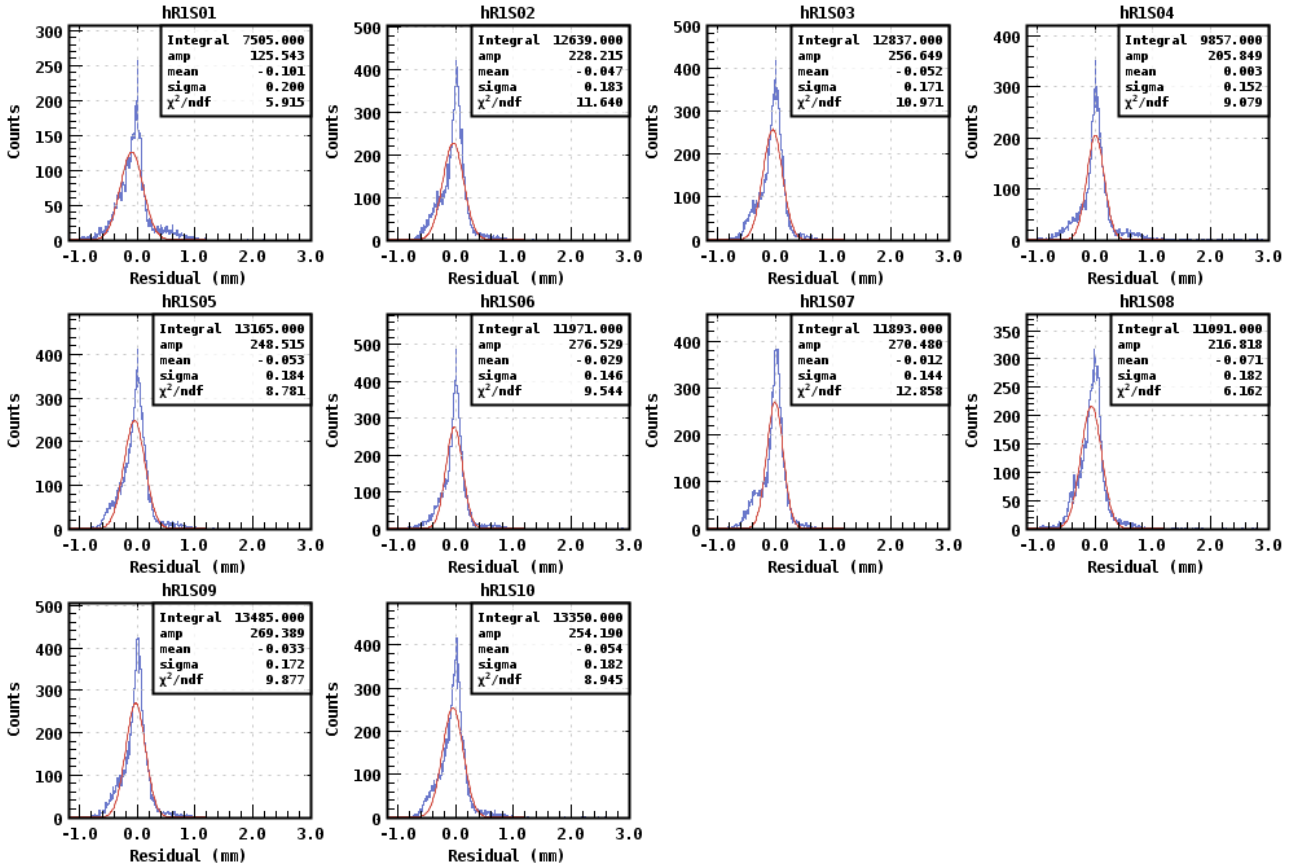




SVT Track-Based Alignment - "Not-So Good"

Simulated, Type-3, events originating from the target (see below) with ideal geometry in simulation show large residuals and widths.

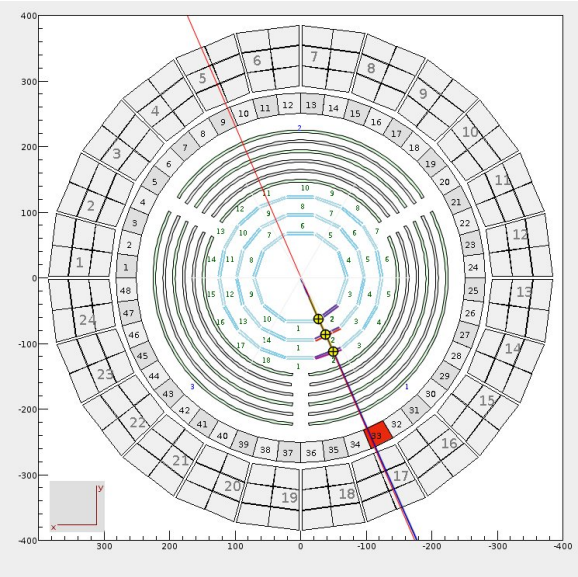


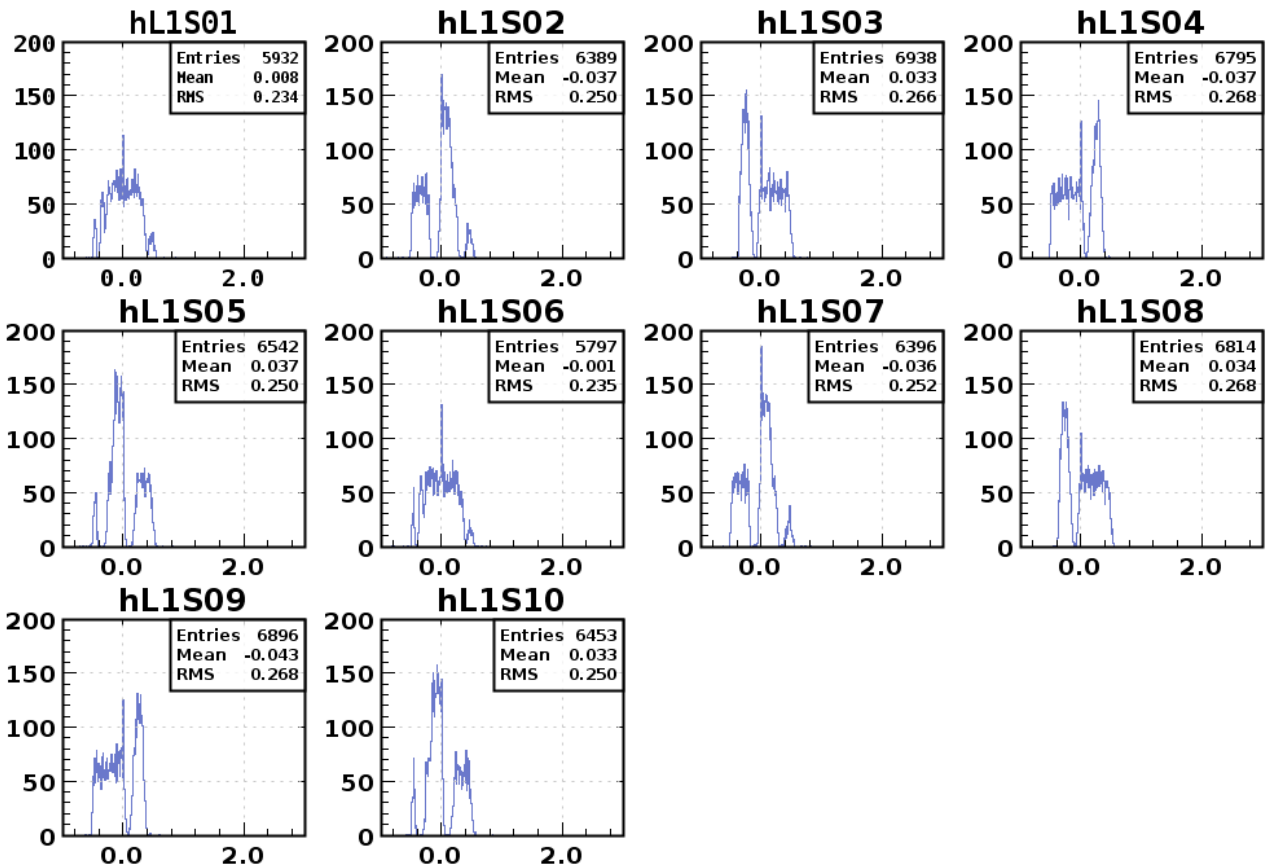


- Residuals in the range $140 - 200\ \mu m$.

SVT Track-Based Alignment - "More Not-So Good"

Simulated, Type-3, events originating from the target (see below) with ideal geometry and zero magnetic field in simulation show large residuals and widths.

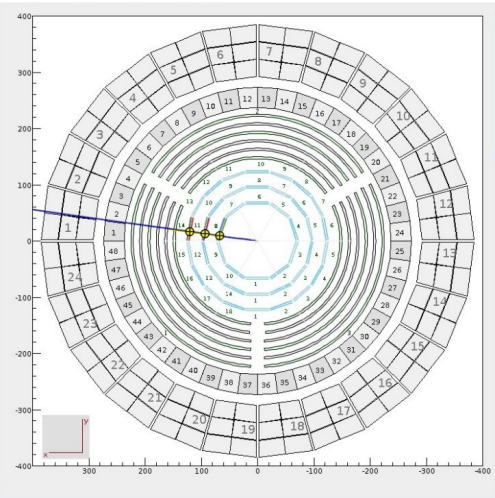


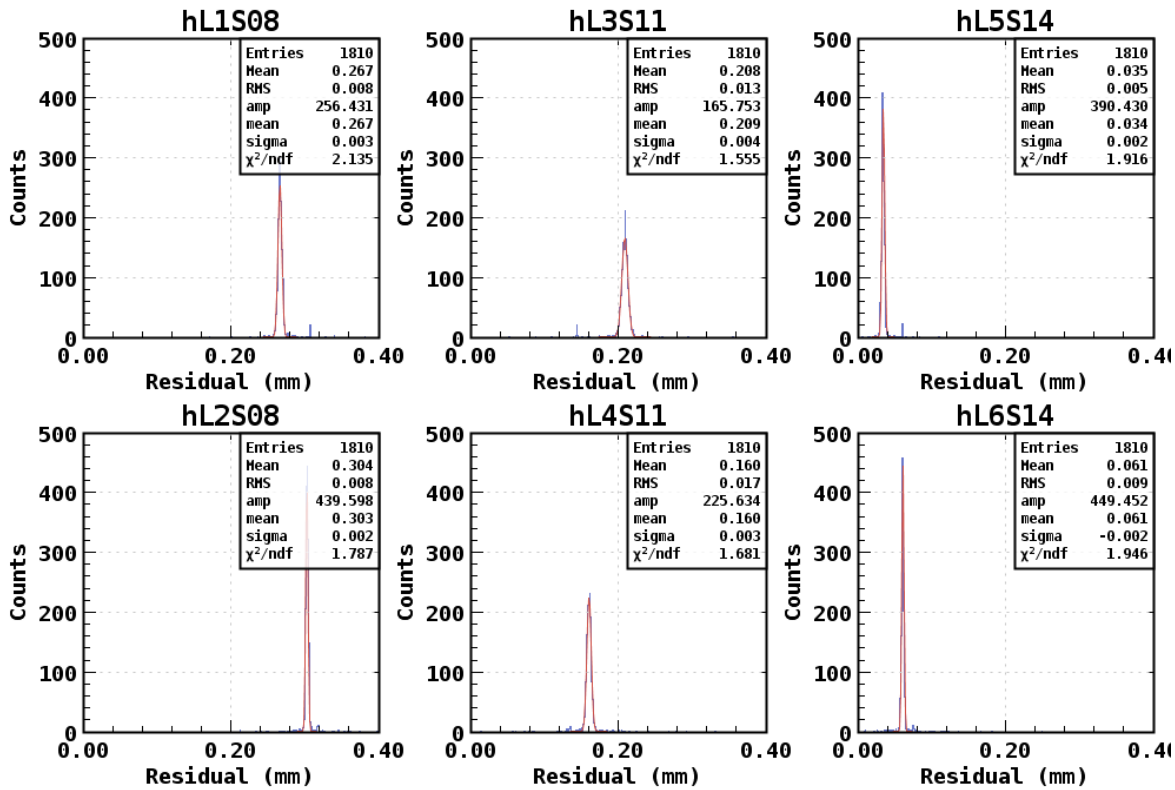


- Fitting validated with Common Tools.
- Residuals $\approx 250\ \mu m$.

SVT Diagnostics: Single $\theta - \phi$ Events

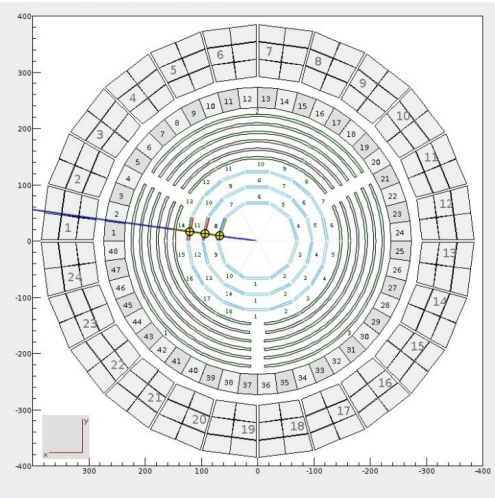
Use the *gemc* particle gun to repeatedly fire protons at the midpoint of a particular strip (center of layer 5, sector 14, strip 128) with no magnetic field and histogram the Common Tools reconstruction results. The peaks are very narrow, but far from zero.

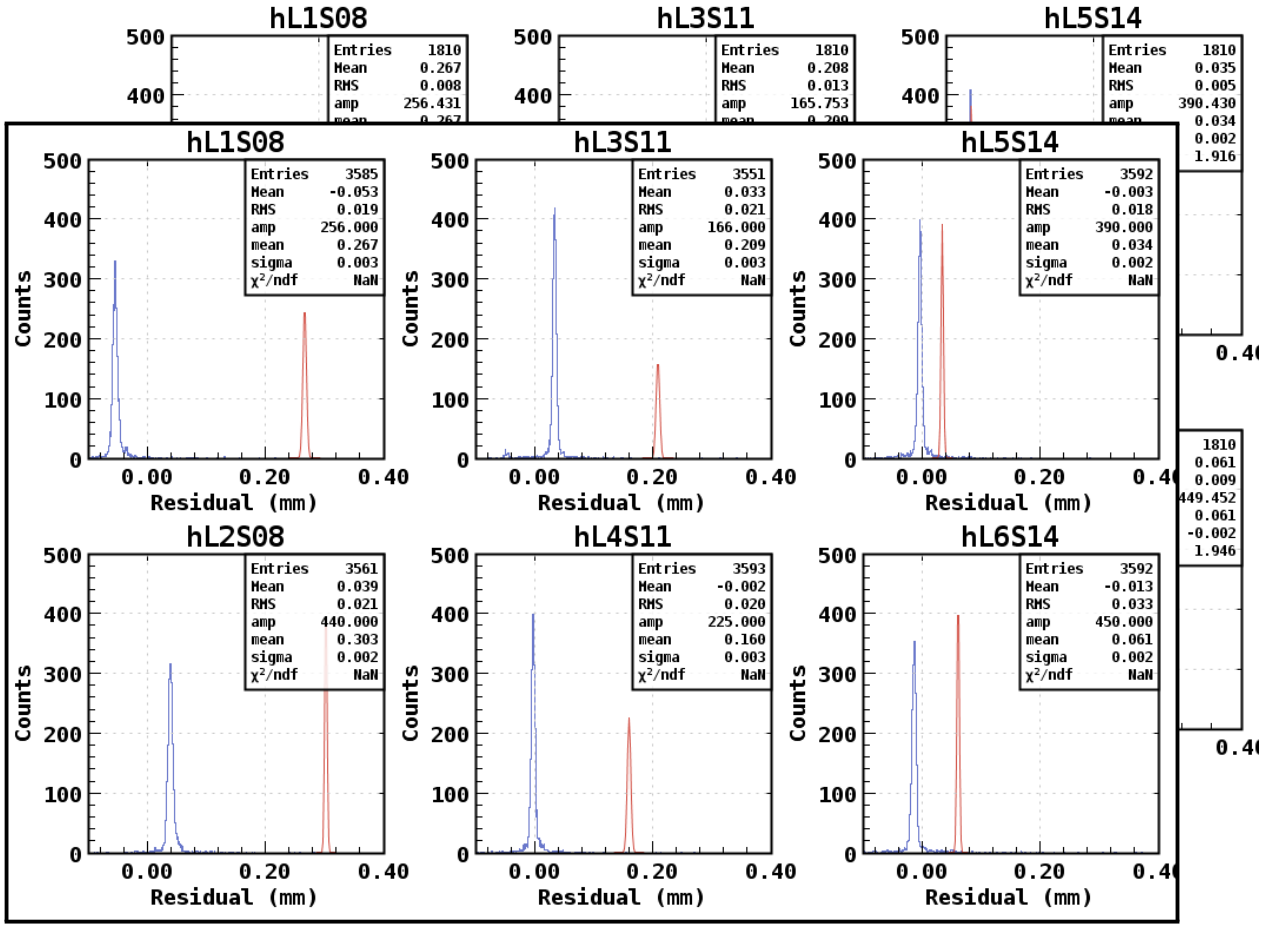




SVT Diagnostics: Single $\theta - \phi$ Events

Use the *gemc* particle gun to repeatedly fire protons at the midpoint of a particular strip (center of layer 5, sector 14, strip 128) with no magnetic field and histogram the Common Tools reconstruction results. The peaks are very narrow, but far from zero.

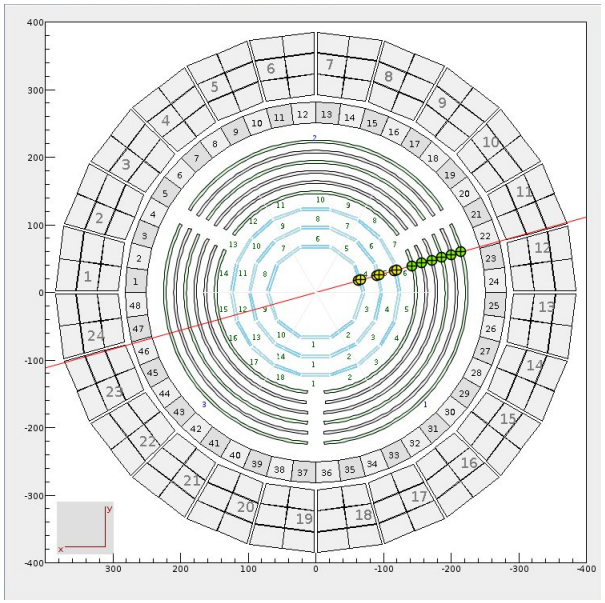


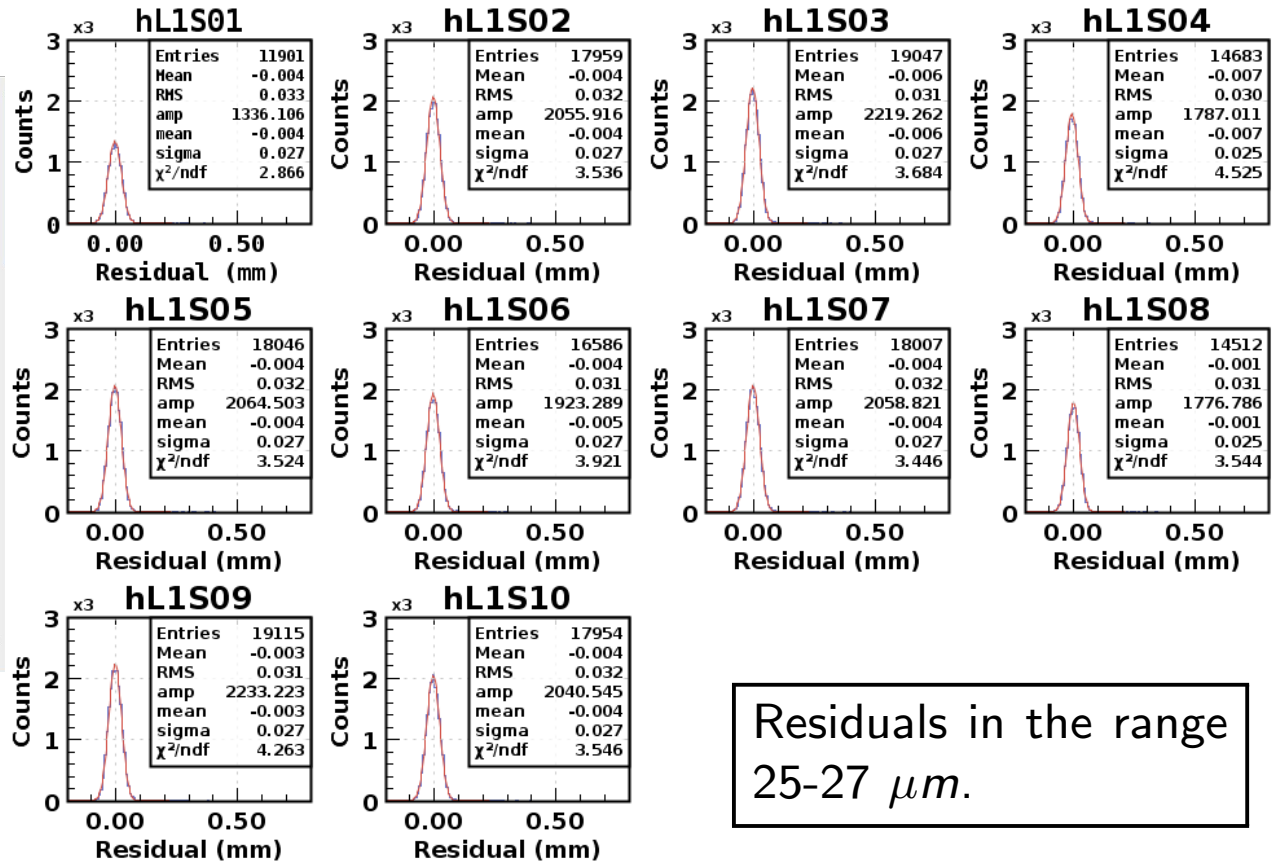


- Use new Tracker code from Maxime.
- Red curves are fits to previous data.
- Blue histograms from Tracker.
- Much smaller residuals.

SVT Testing: Simulated Events

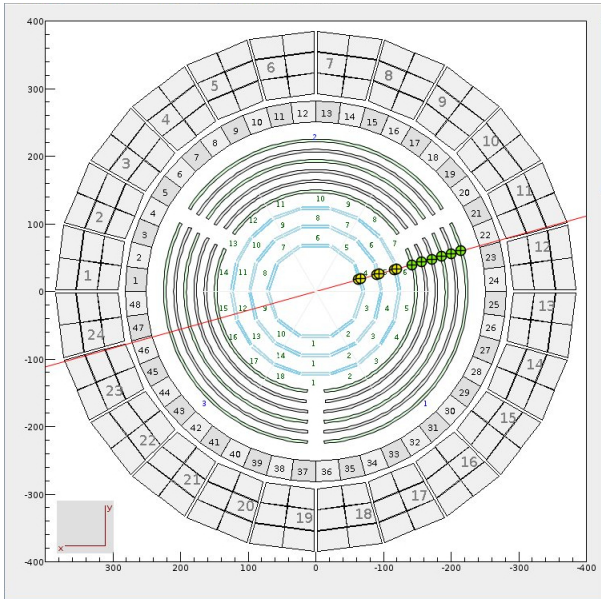
Use the *gemc* particle gun to spray protons in the ranges $E_p = 4 - 8$ GeV, $\theta = 80^\circ - 120^\circ$, and all ϕ and reconstruct with Tracker. Magentic field is zero and micromegas are included in the event. Residuals for layer 1 are shown below. Note the horizontal scale.

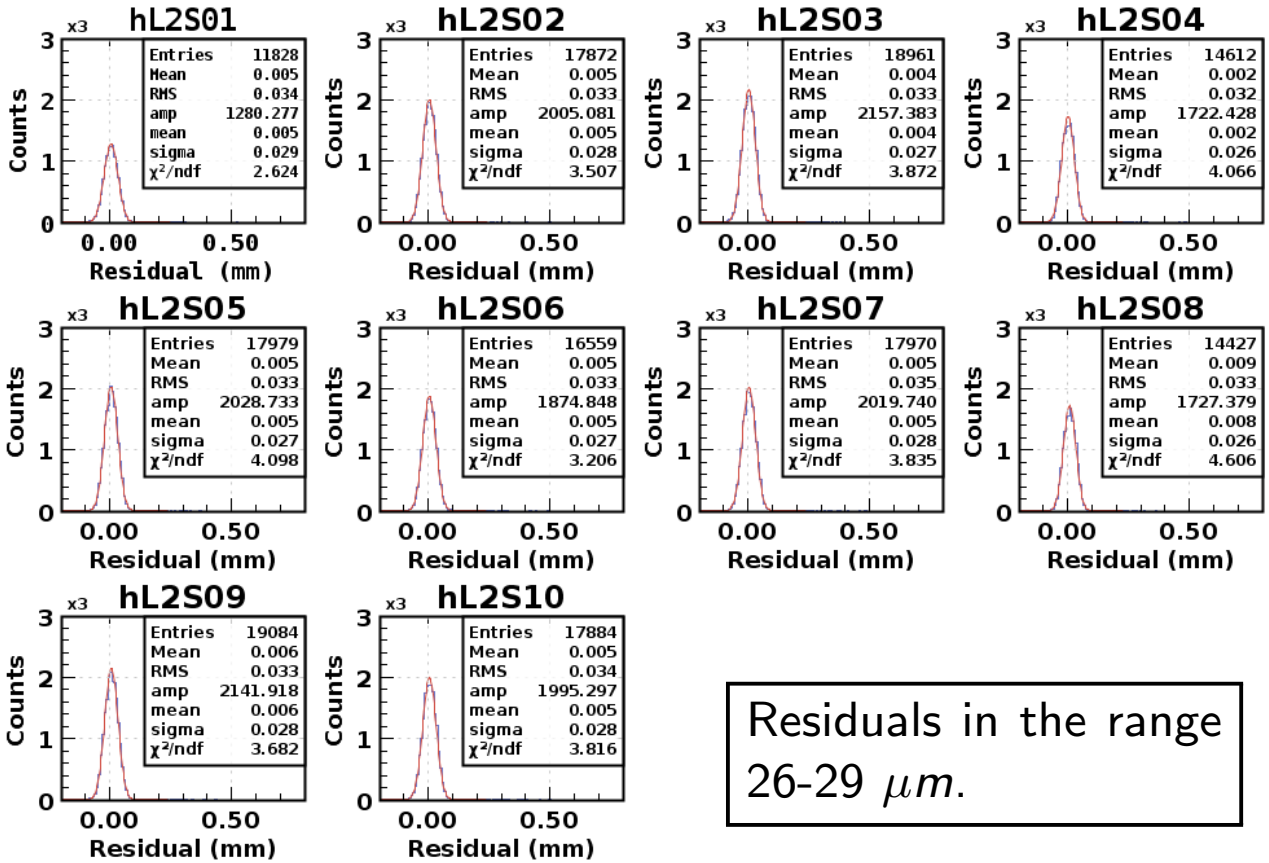




Residuals in the range 25-27 μm.

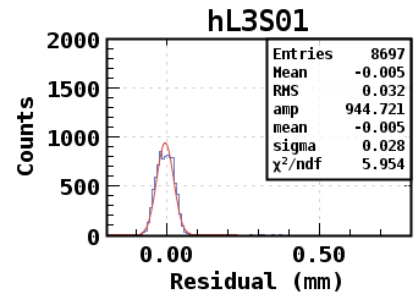
SVT Testing: Simulated Events, Layer 2

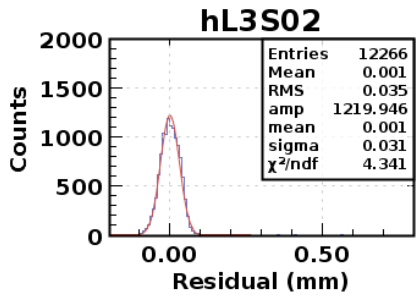


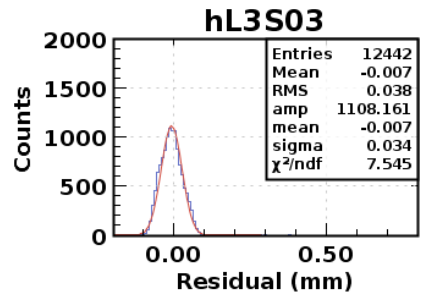


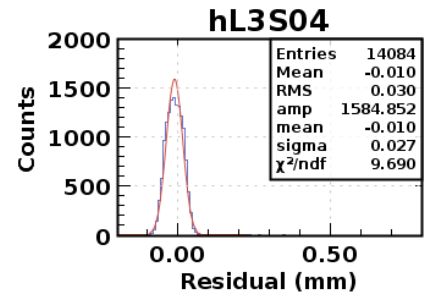
Residuals in the range 26-29 μm.

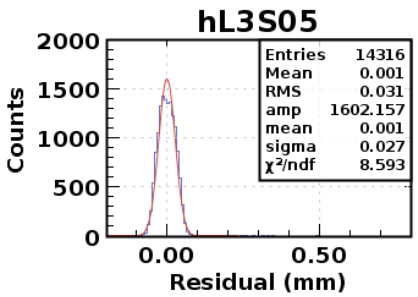
SVT Testing: Simulated Events, Layer 3

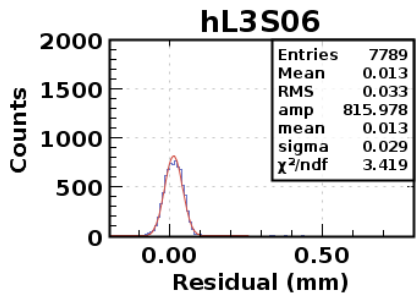


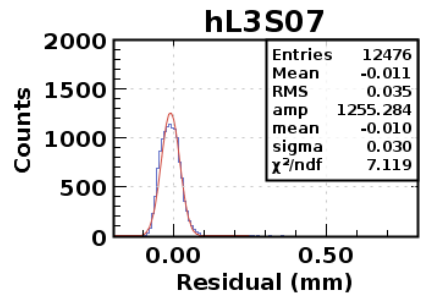


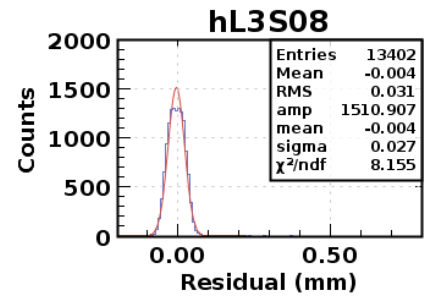


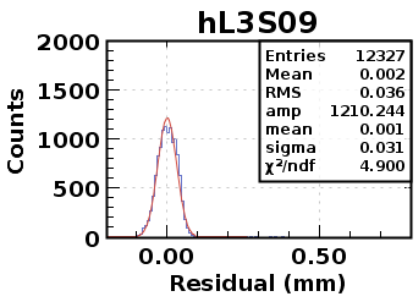


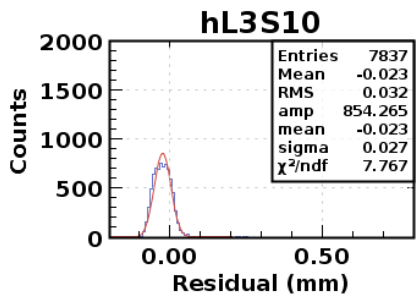


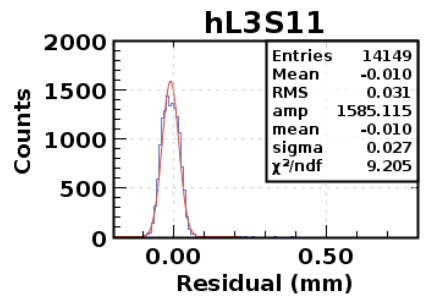


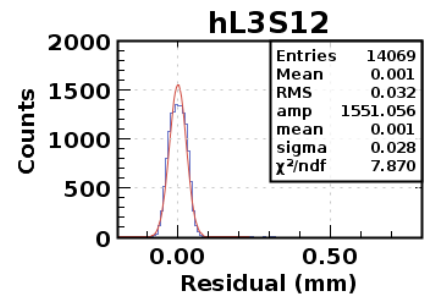


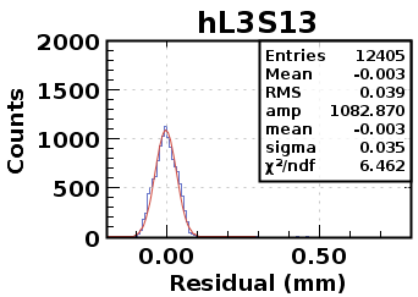


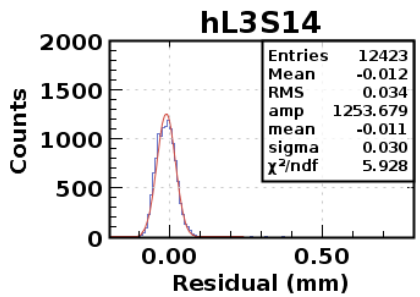




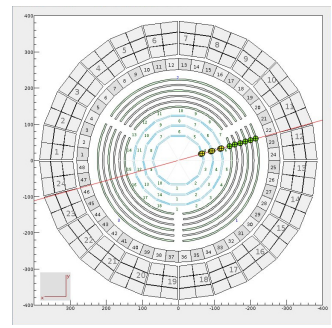




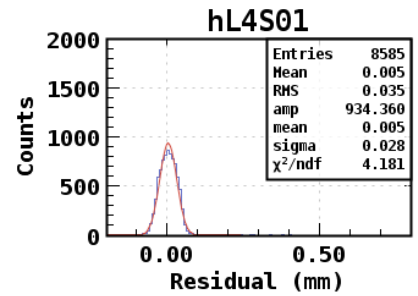


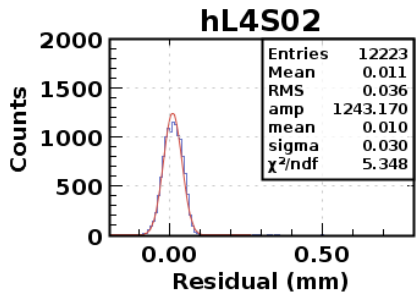


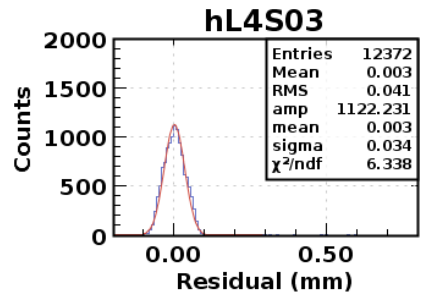
Residuals in the range 28-35 μm.

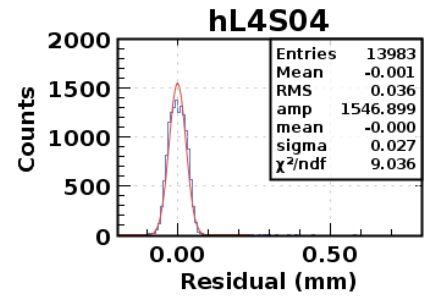


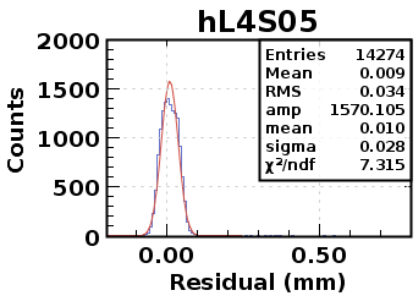
SVT Testing: Simulated Events, Layer 4

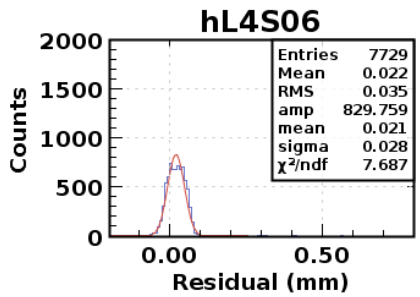


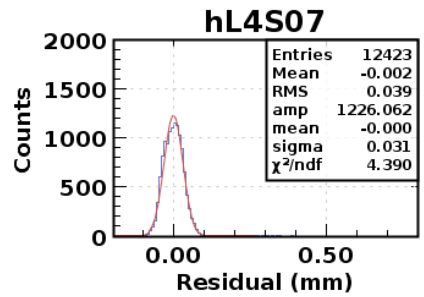


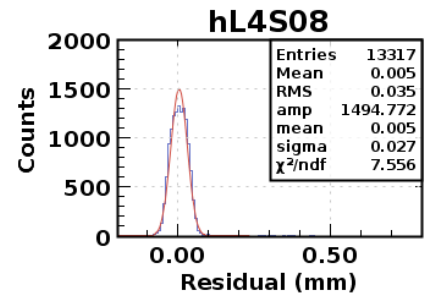


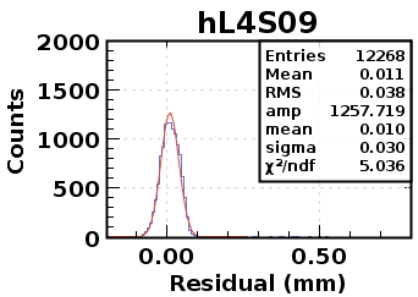


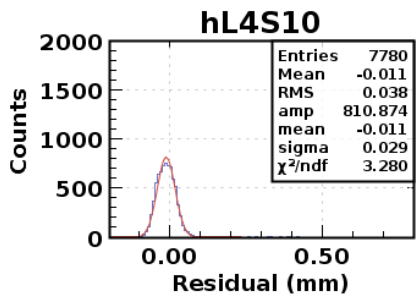


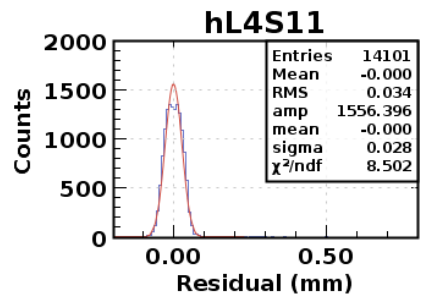


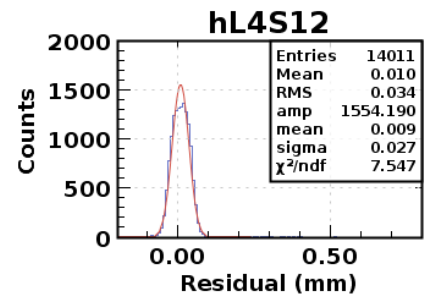


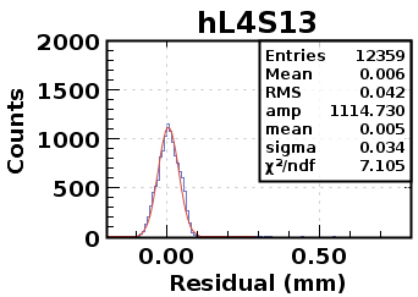


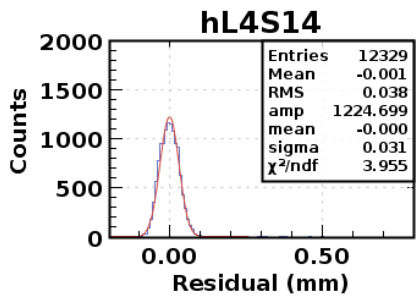




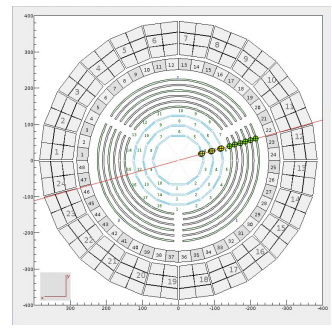




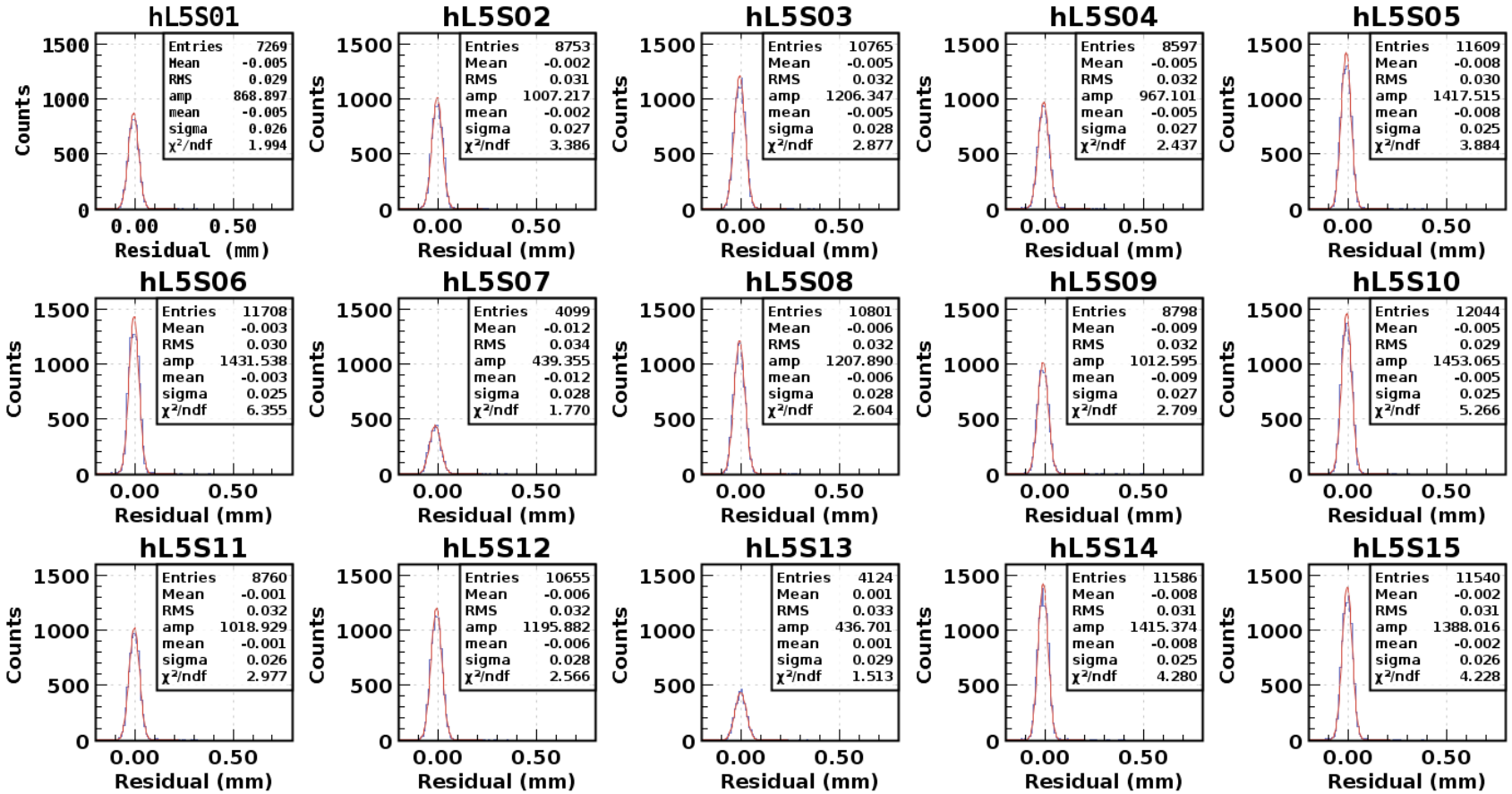




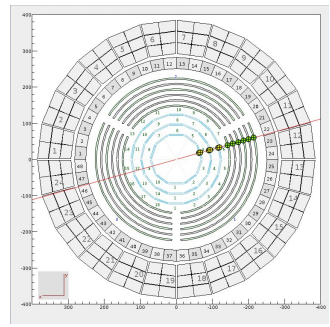
Residuals in the range 28-34 μm.



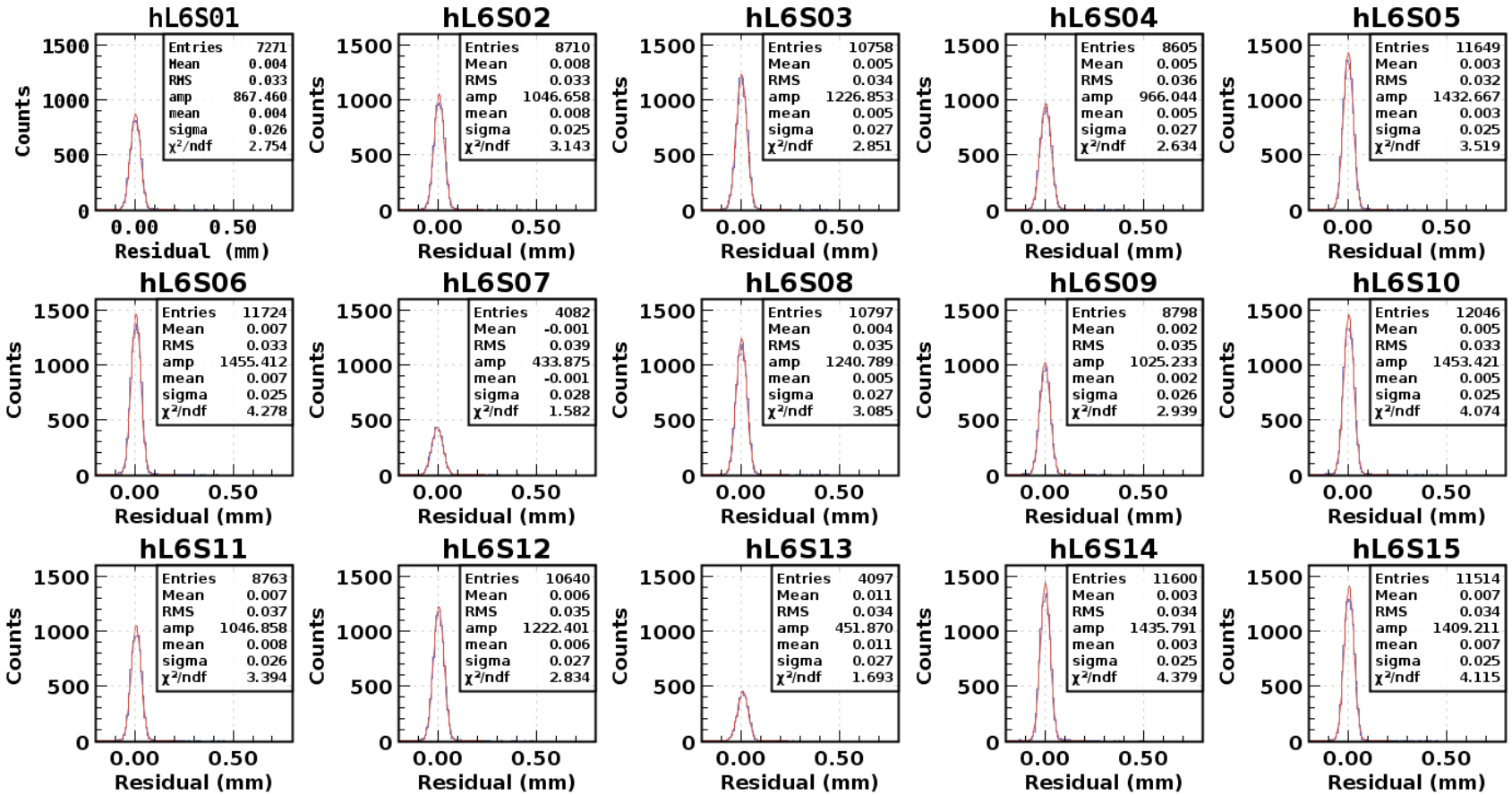
SVT Testing: Simulated Events, Layer 5



Residuals in the range 25-29 μm.



SVT Testing: Simulated Events, Layer 6



Residuals in the range 25-28 μm.