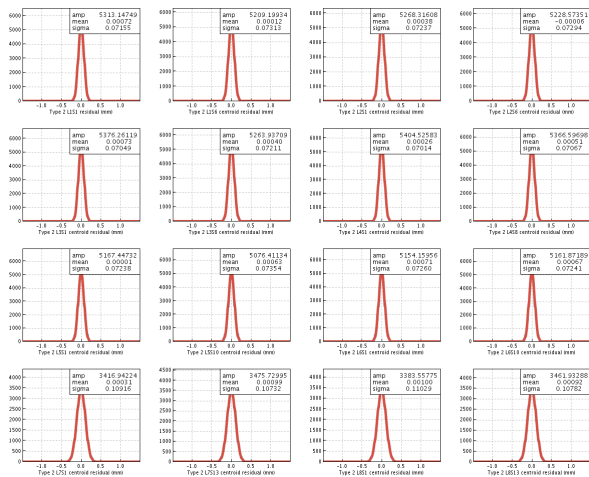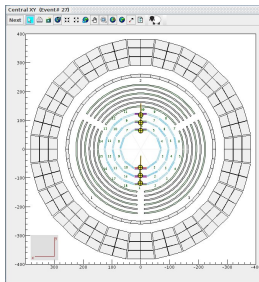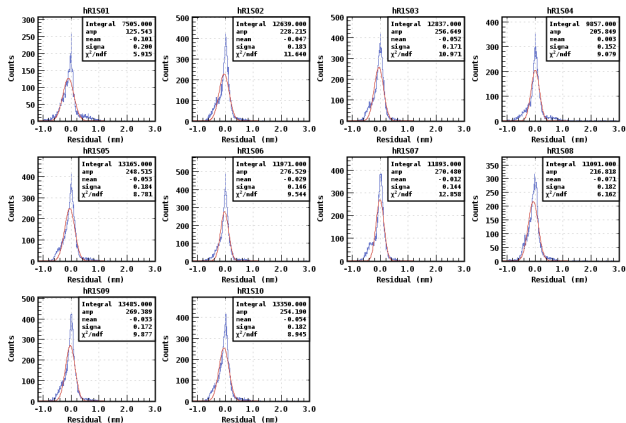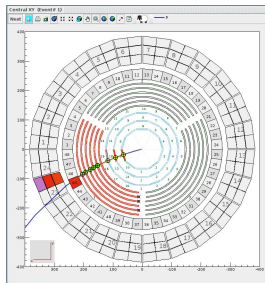# SVT Track-Based Alignment - "The Good"

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 $140 - 200$ $\mu m$.
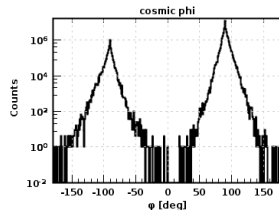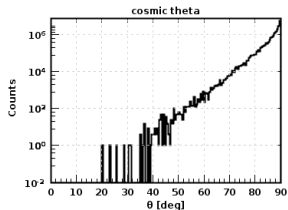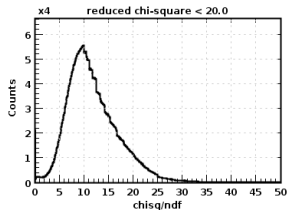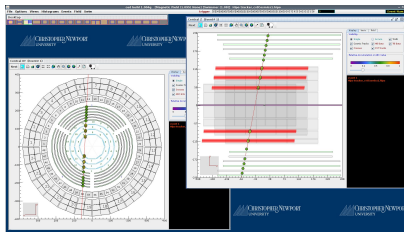
# SVT Testing: Simulated Events from the Target

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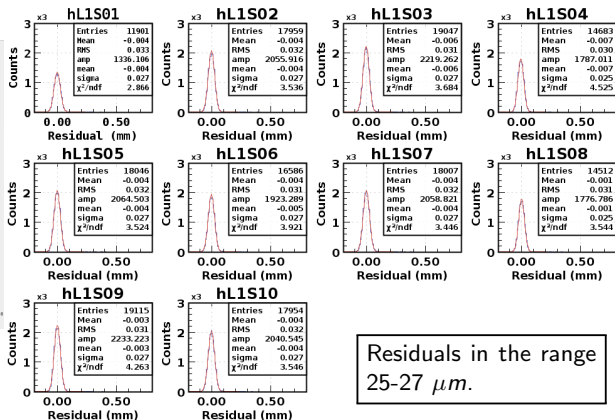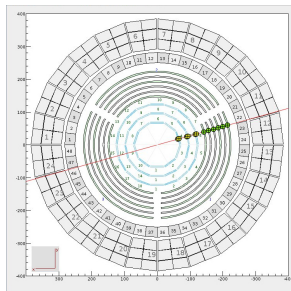


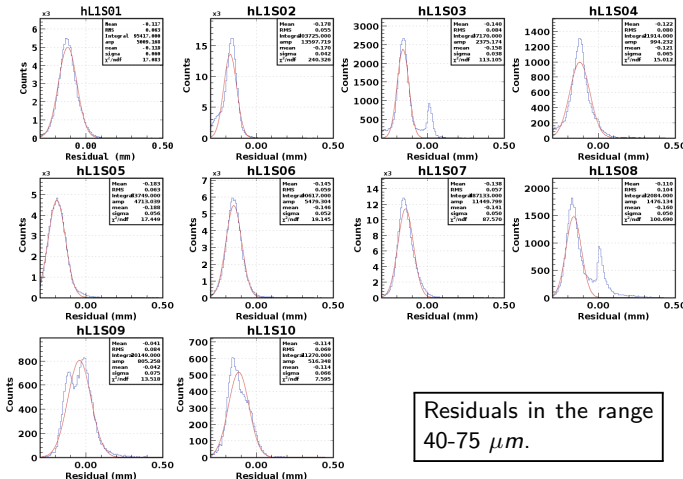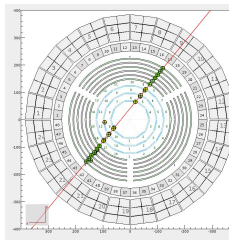Residuals in the range 25-27 $\mu m$.

# SVT Testing: Simulated Events from Cosmics

Use the *gemc* particle gun to simulate cosmic rays hitting CLAS12. Magnetic field is zero and micromegas are included in the event. Require twelve crosses/layers in the event to be accepted. Distributions for all accepted events are shown below.
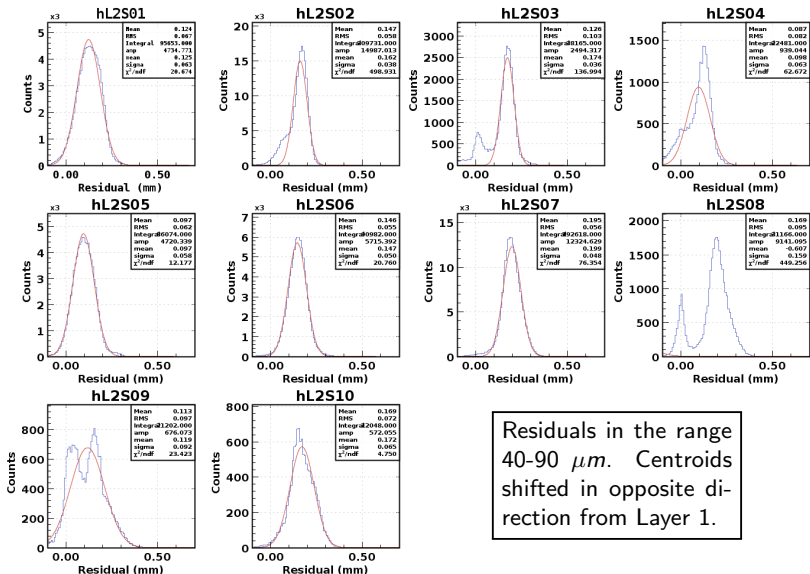
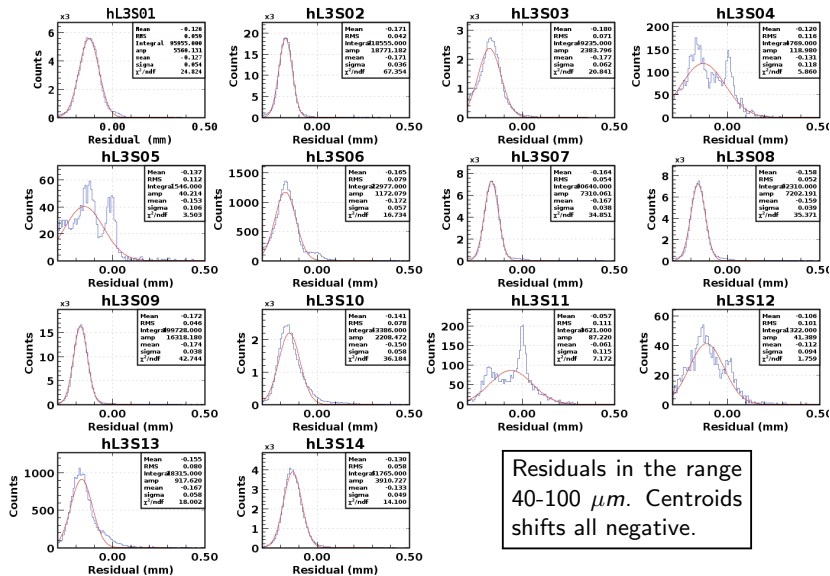# SVT Testing: Simulated Events from Cosmics Layer 1

Use the *gemc* particle gun to simulate cosmic rays hitting CLAS12. Magnetic field is zero and micromegas are included in the event. Require twelve crosses/layers in the event to be accepted. Residuals for layer 1 are shown below. Note the horizontal scale.
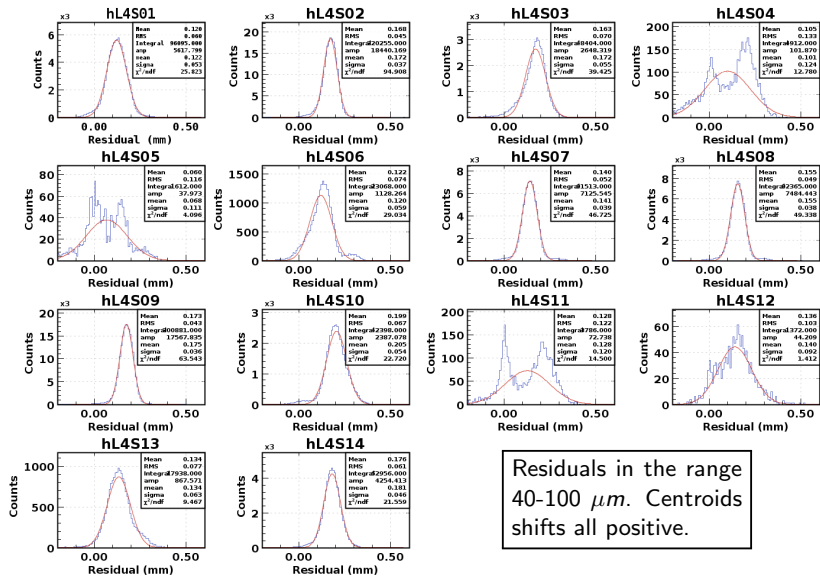


Residuals in the range 40-75 $\mu m$.

# SVT Testing: Simulated Events from Cosmics Layer 2



Residuals in the range 40-90 $\mu m$. Centroids shifted in opposite direction from Layer 1.
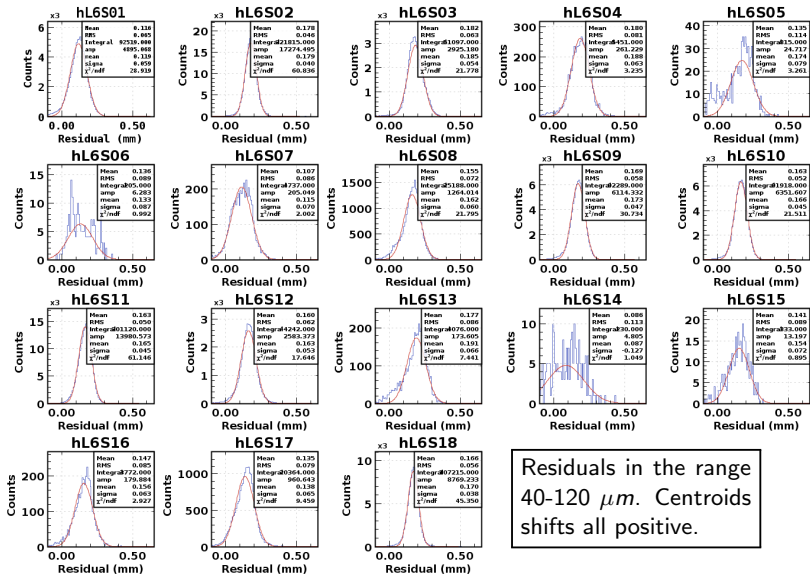
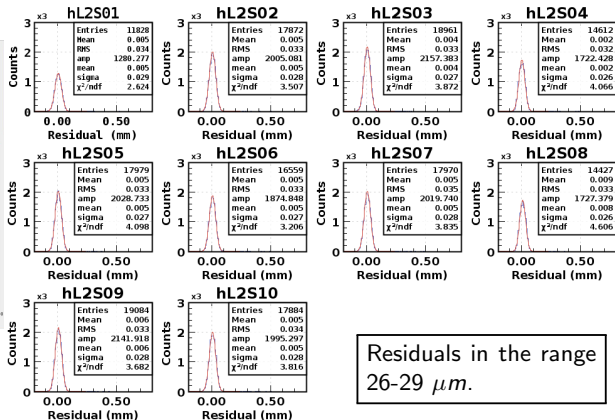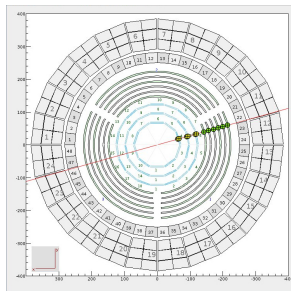# SVT Testing: Simulated Events from Cosmics Layer 3
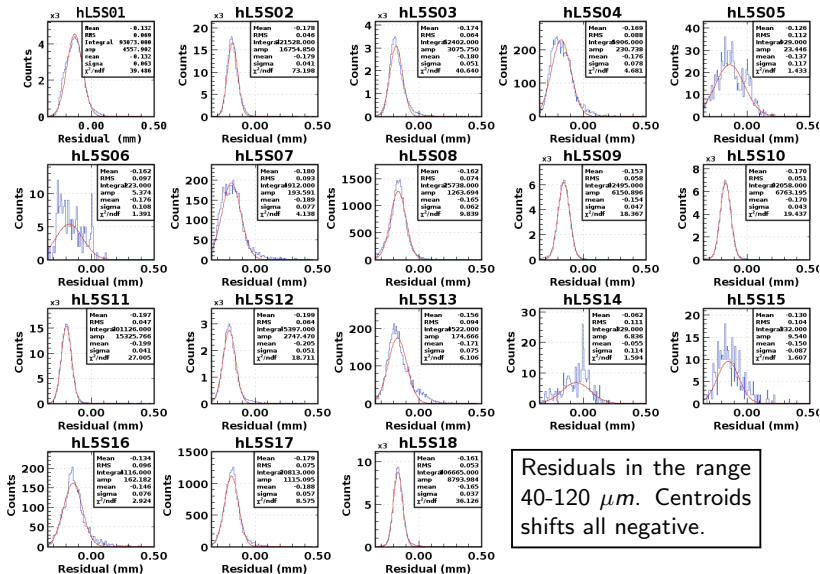


Residuals in the range 40-100 $\mu m$. Centroids shifts all negative.
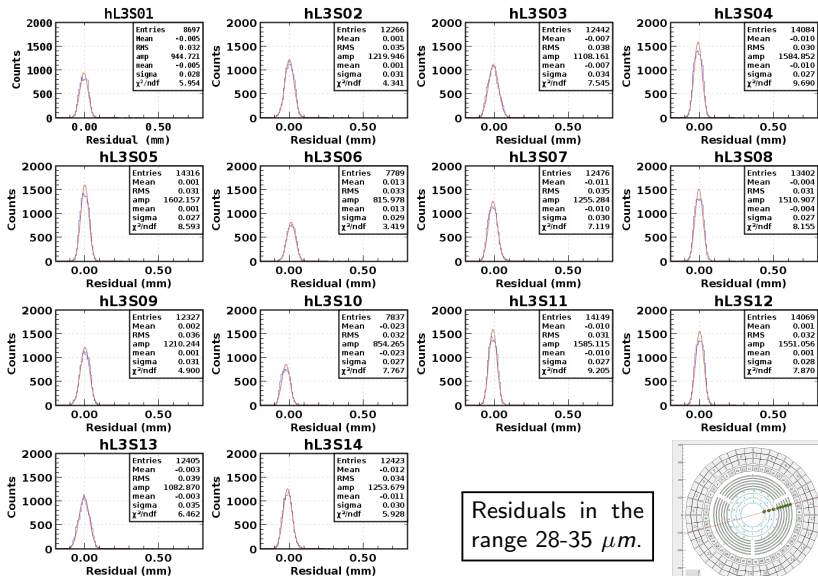
# SVT Testing: Simulated Events from Cosmics Layer 4



Residuals in the range 40-100 $\mu m$. Centroids shifts all positive.

Residuals in the range 40-120 $\mu m$. Centroids shifts all negative.

Residuals in the range 40-120 $\mu m$. Centroids shifts all positive.

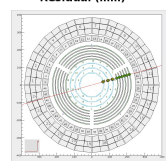Residuals in the range 26-29 $\mu m$.

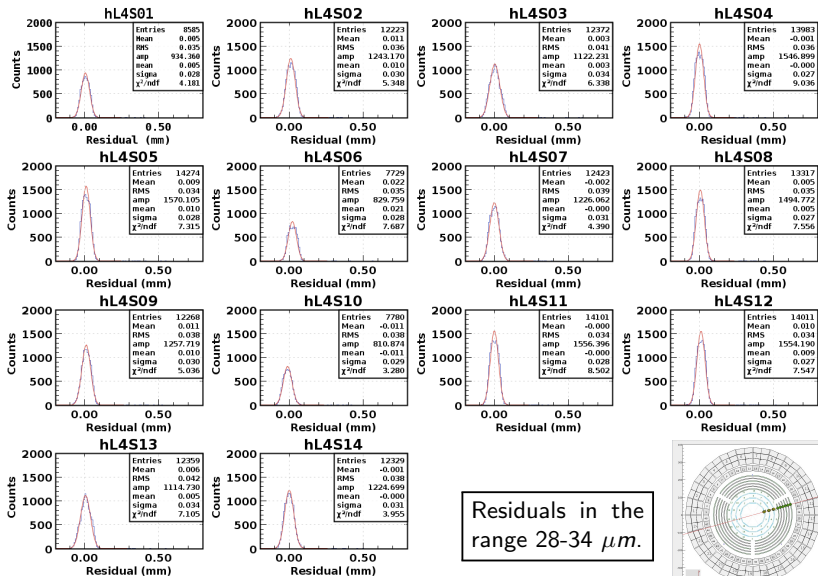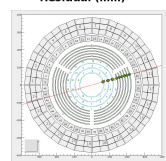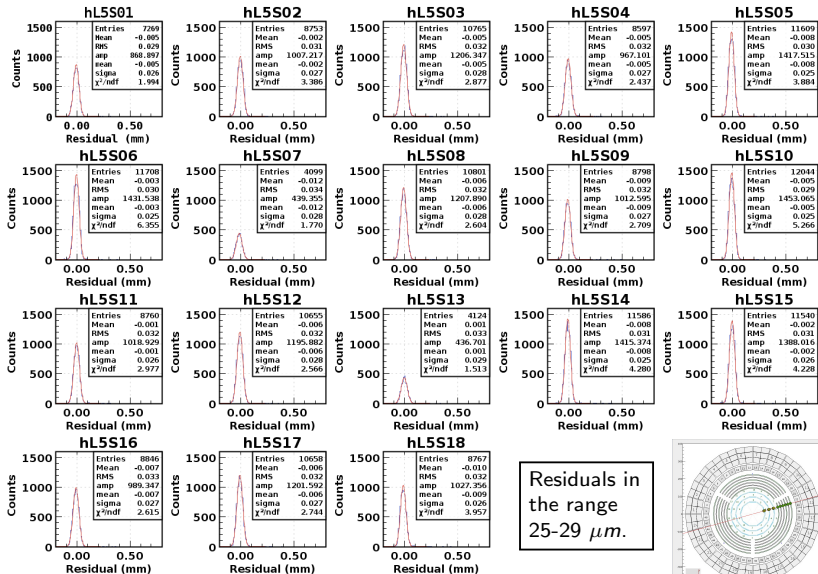Residuals in the range 28–35 $\mu m$.

# SVT Testing: Simulated Target Events, Layer 4



Residuals in the range 28-34 $\mu m$.

# SVT Testing: Simulate Target Events, Layer 5



Residuals in the range 25-29 $\mu m$.

Residuals in the range 25-28 $\mu m$.