Bias Scans 2016

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Method

- ▶ Use run 007457 (bias scan run) and perform cluster analysis and hit efficiency analysis in layer 1
- ▶ Bias scan was run for voltages of 20 to 180 V in increments of 20 V
- ▶ Fit the charge distribution to a Laudau-Gaussian convolution
- ▶ Grab the mean value from the fit and plot it against bias voltage
- ▶ Make plots for all clusters, single hit clusters, multiple hit clusters, and clusters of hits on track
- ▶ Plot the hit efficiency (see hit efficiency studies for more detail) as a function of bias voltage
- ▶ Plot the hit efficiency as a function of bias voltage and hit position in layer 1.

Sample Bad Fits

▶ Bias Voltage of 20 V and 40 V were excluded form the analysis as their peaks are run into the x-ray region
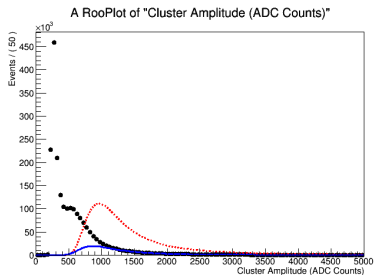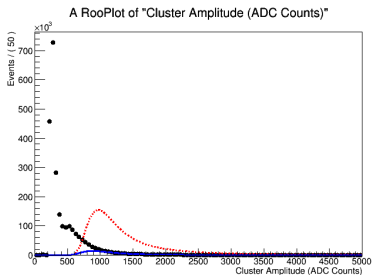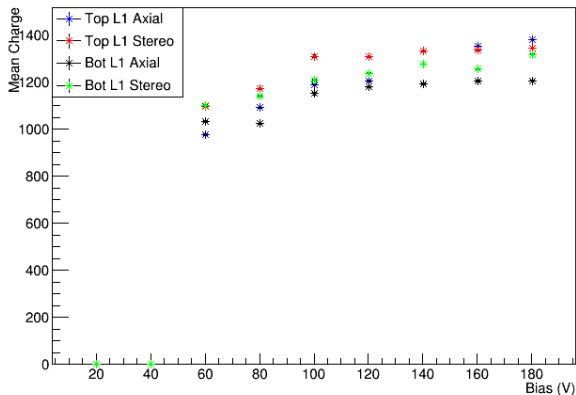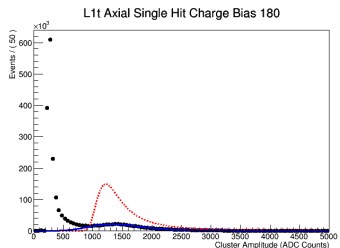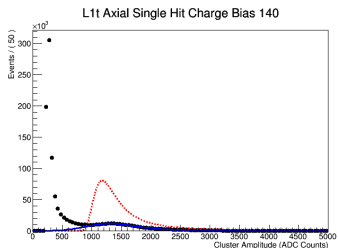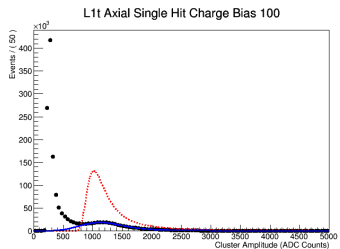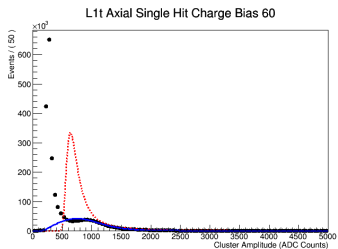
Sample Fits All Clusters
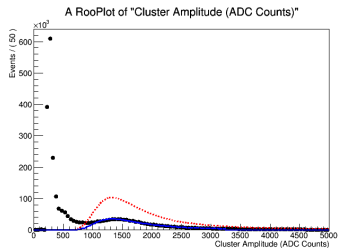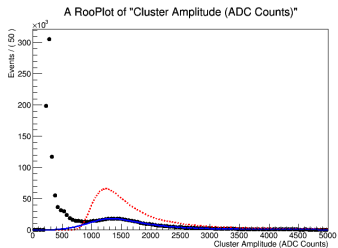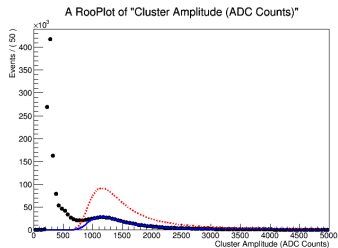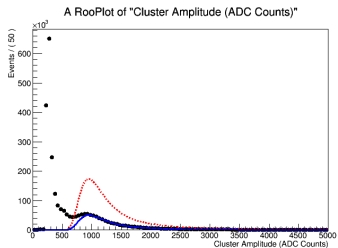
Bias Scans All Clusters

Mean Charge for Varying Bias
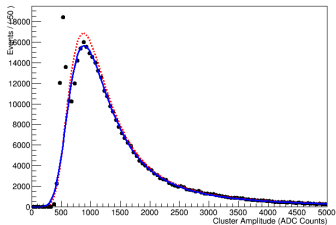
Sample Fits Single Hit Clusters

Bias Scans Single Hit Clusters

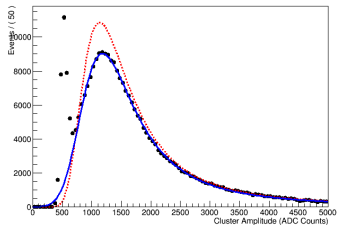Mean Charge for Varying Bias Single Hit Clusters
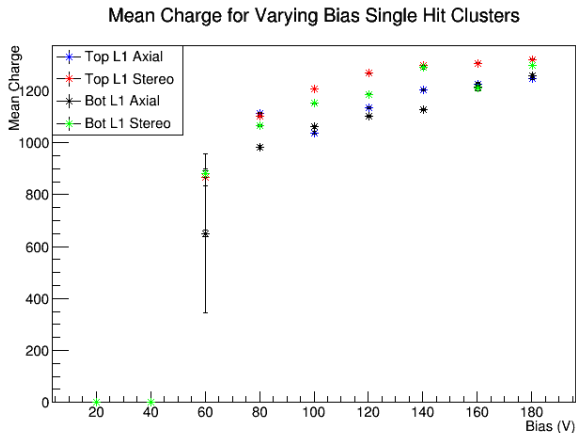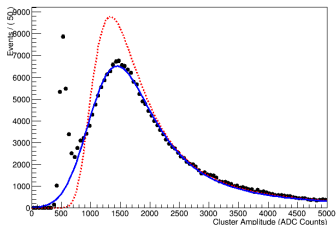
Sample Fits Multiple Hit Clusters

L1t Axial Multiple Hit Charge Bias 60
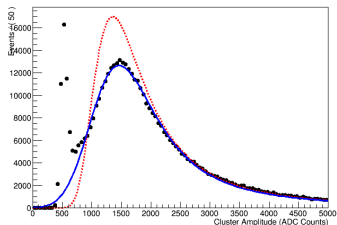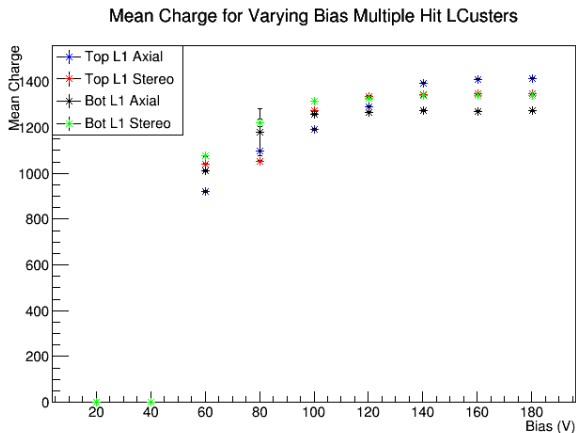
L1t Axial Multiple Hit Charge Bias 100
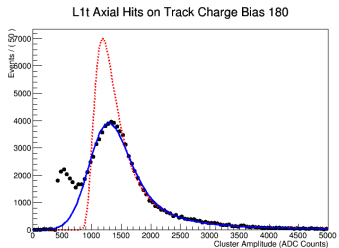
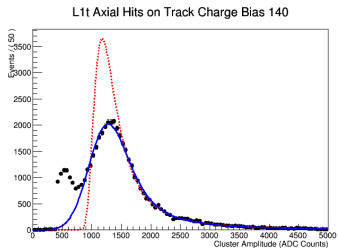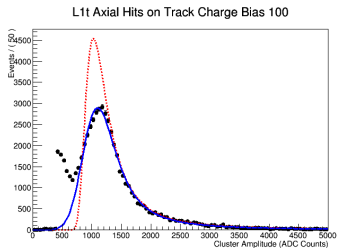L1t Axial Multiple Hit Charge Bias 140

L1t Axial Multiple Hit Charge Bias 180

Bias Scans Multiple Hit Clusters

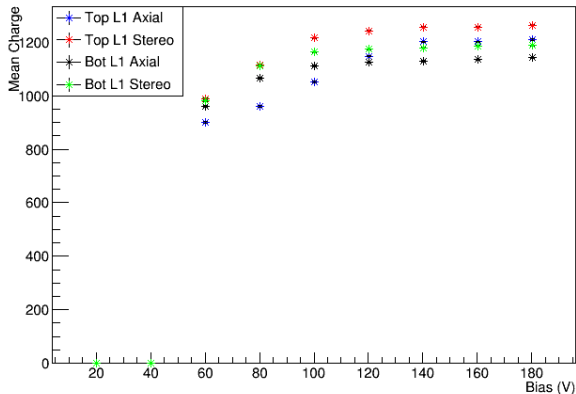Mean Charge for Varying Bias Multiple Hit LCusters
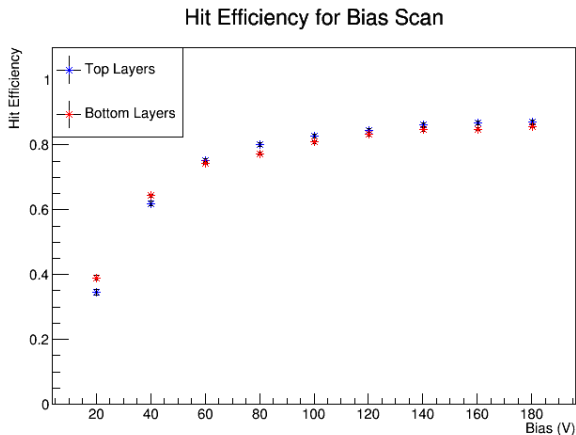
Sample Fits Clusters on Tracks
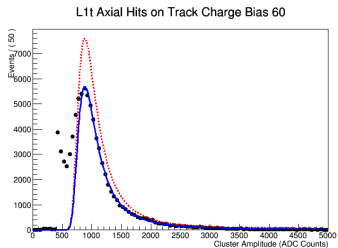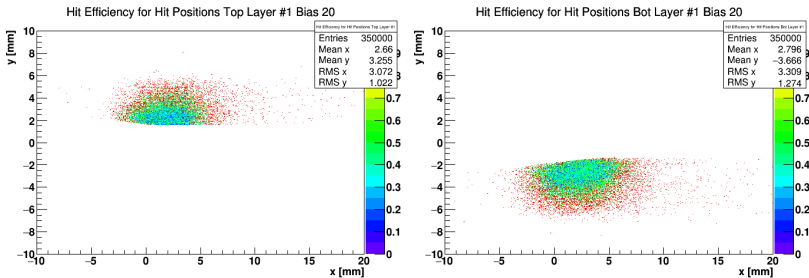
Bias Scans Clusters on Tracks

Mean Charge for Varying Bias Hits on Track

Bias Scans Hit Efficiency

Hit Efficiency for Bias Scan

Bias Scans Hit Efficiency Bias 20 V

Bias Scans Hit Efficiency Bias 40 V

Hit Efficiency for Hit Positions Top Layer #1 Bias 40

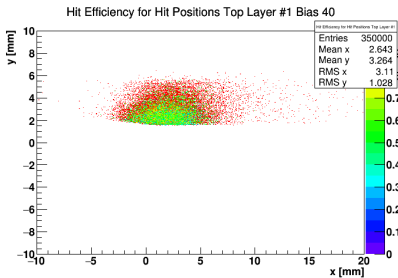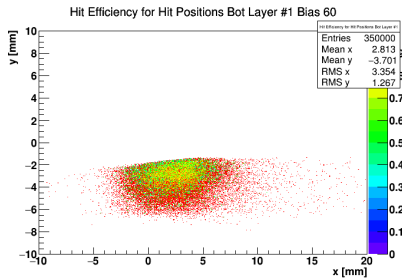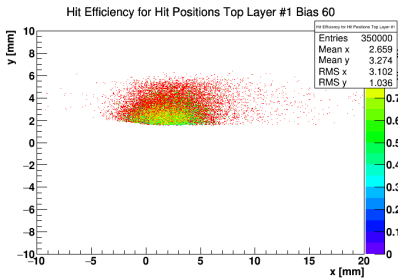Hit Efficiency for Hit Positions Bot Layer #1 Bias 40
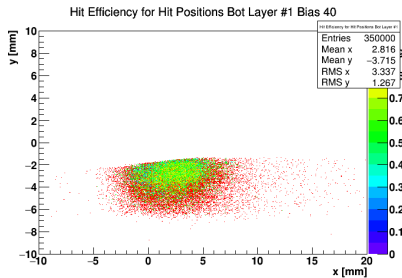
Bias Scans Hit Efficiency Bias 60 V

Bias Scans Hit Efficiency Bias 80 V

Hit Efficiency for Hit Positions Top Layer #1 Bias 80

Hit Efficiency for Hit Positions Bot Layer #1 Bias 80

Bias Scans Hit Efficiency Bias 100 V

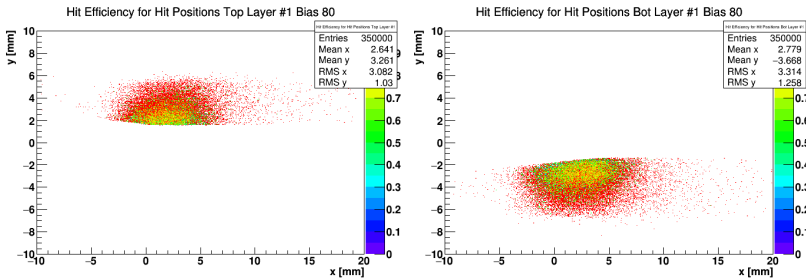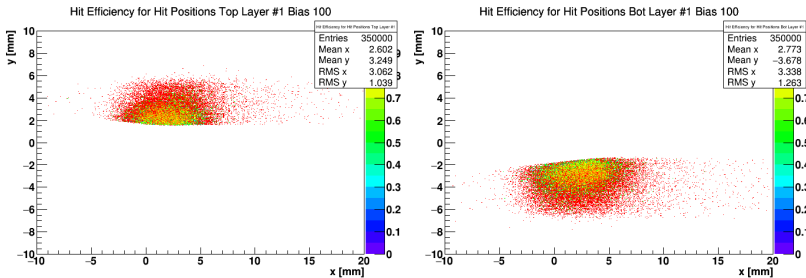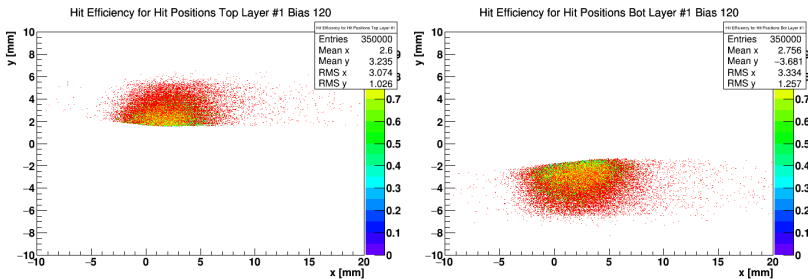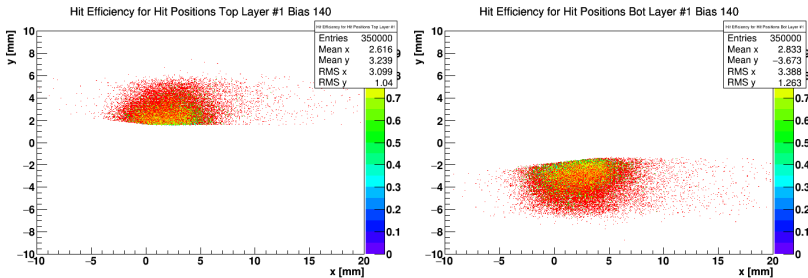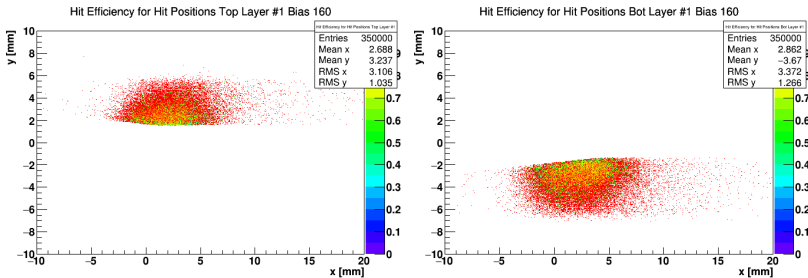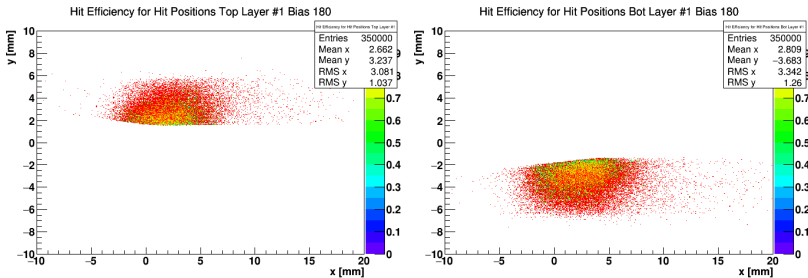# Bias Scans Hit Efficiency Bias 120 V

Bias Scans Hit Efficiency Bias 140 V

Bias Scans Hit Efficiency Bias 160 V

Bias Scans Hit Efficiency Bias 180 V

Hit Efficiency for Hit Positions Top Layer #1 Bias 180

Hit Efficiency for Hit Positions Bot Layer #1 Bias 180

Things to do

- Ideally, we should obtain the mean of the charge distribution fit as a function of layer 1 hit location
- This will be difficult since we are limitted by statistics and fitting can be very tricky