Bias Scans 2016

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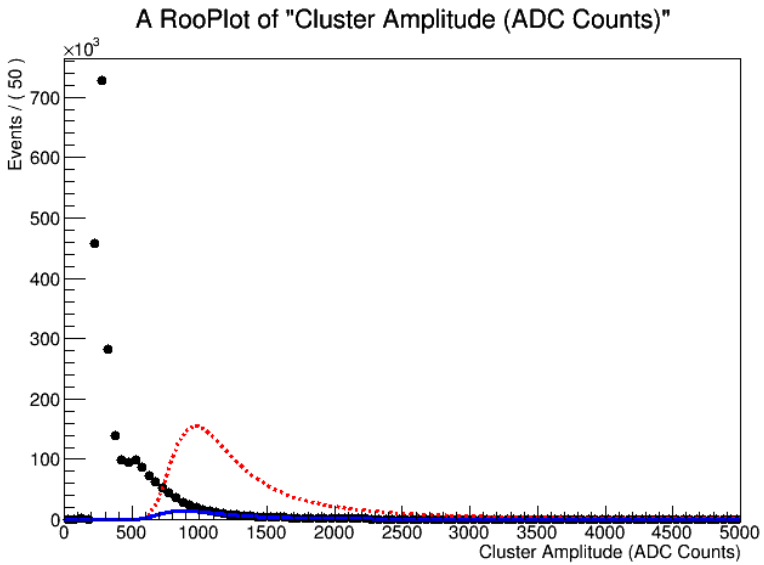
July 6, 2016

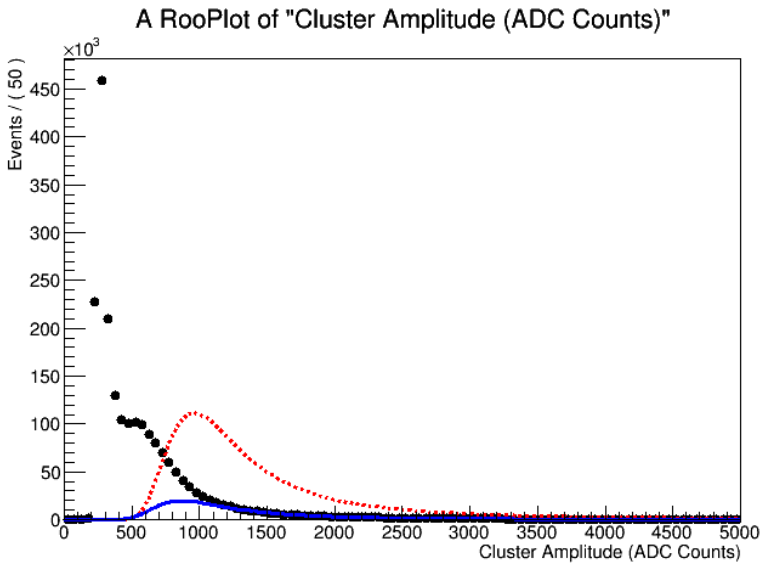
Method

- 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.

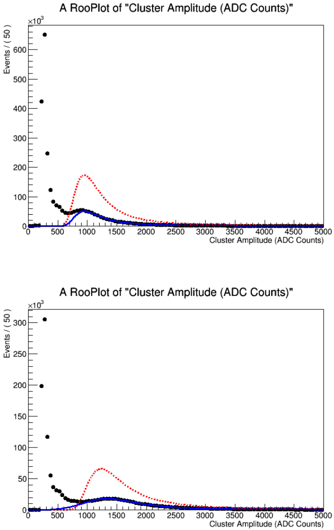
Sample Bad Fits

- Bias Voltage of 20 V and 40 V were excluded form the analysis as their peaks are run into the x-ray region

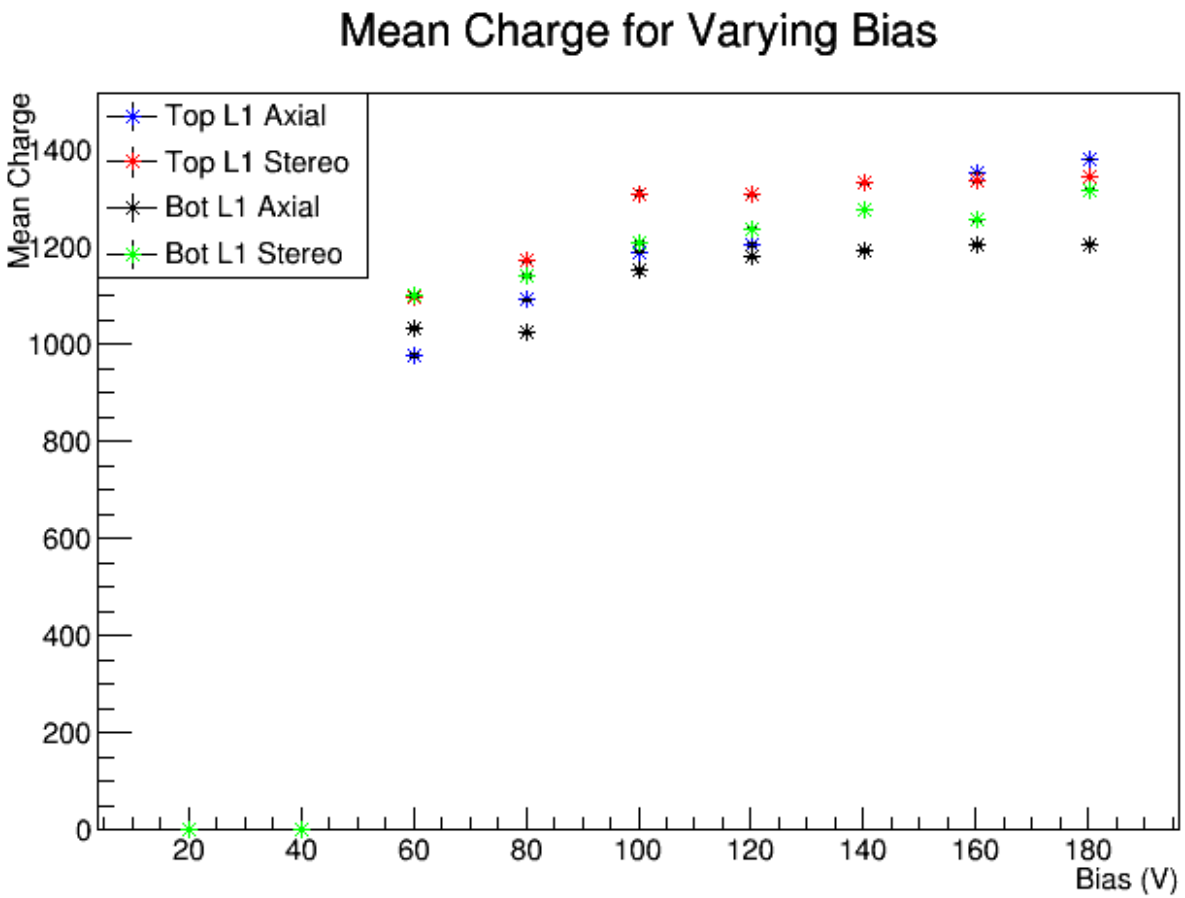




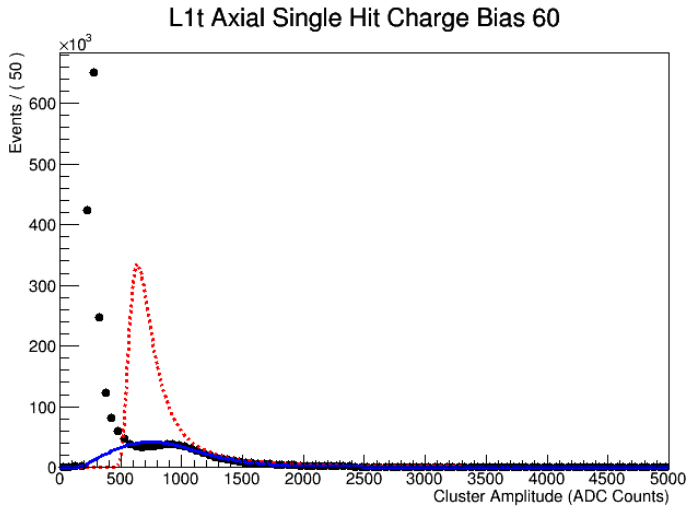
Sample Fits All Clusters

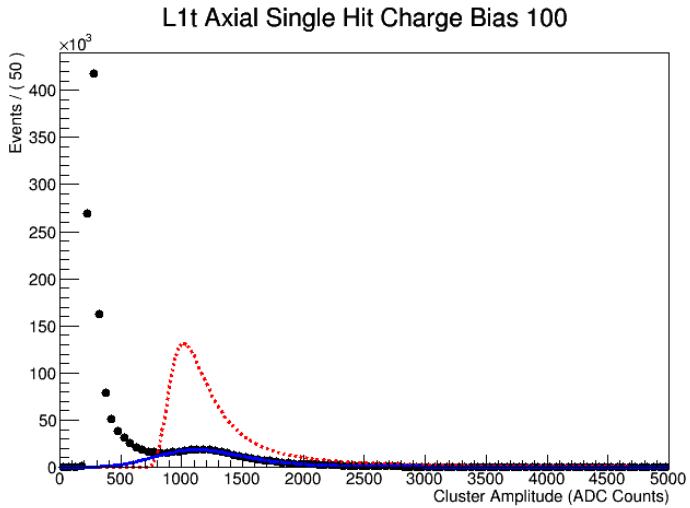


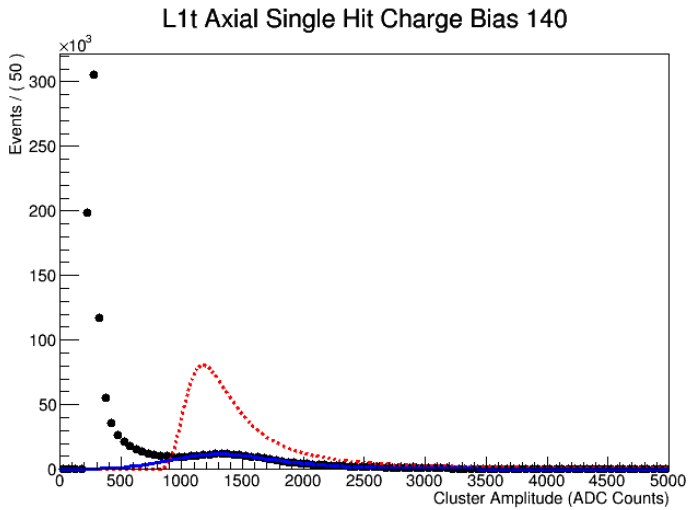
Bias Scans All Clusters

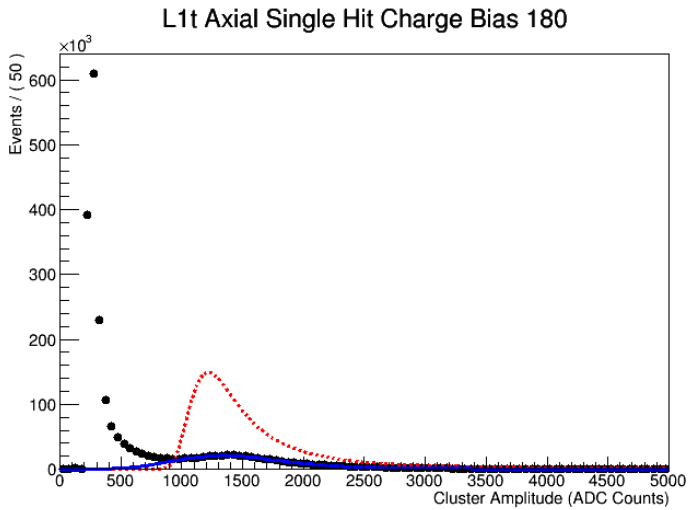


Sample Fits Single Hit Clusters

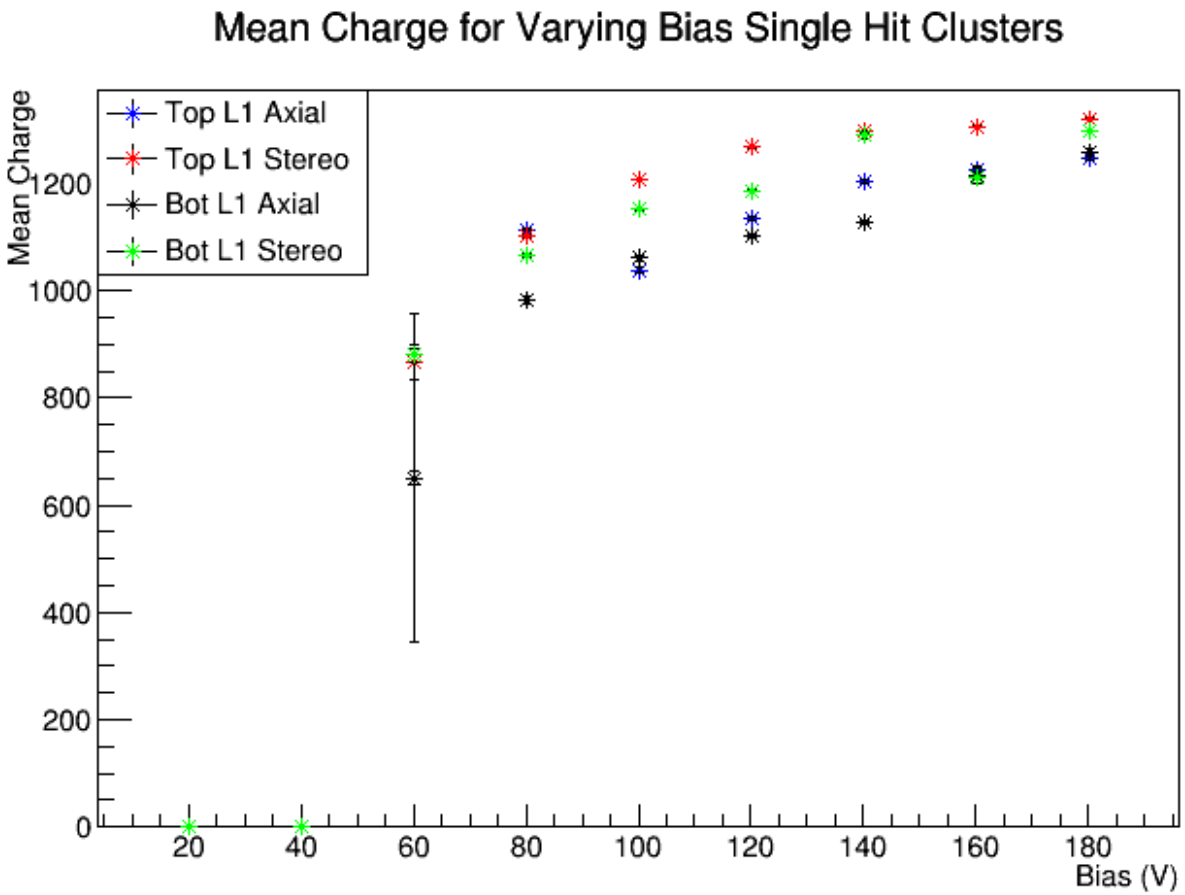




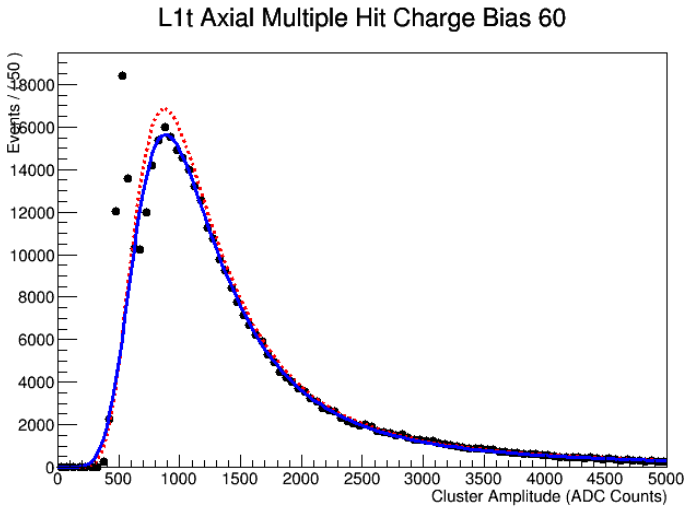


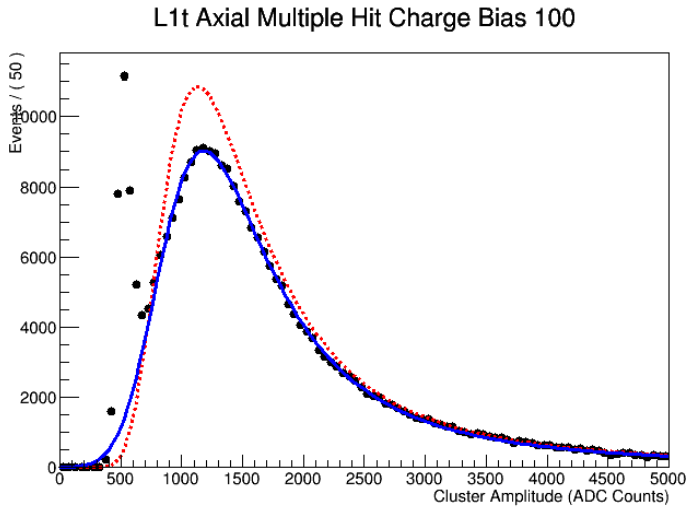


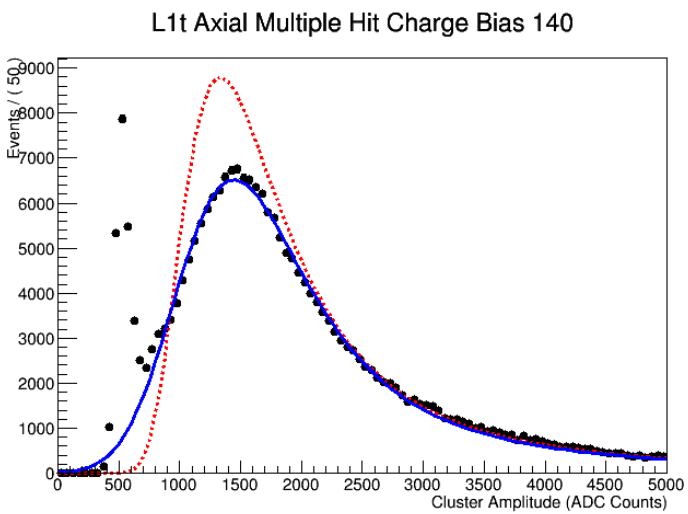
Bias Scans Single Hit Clusters

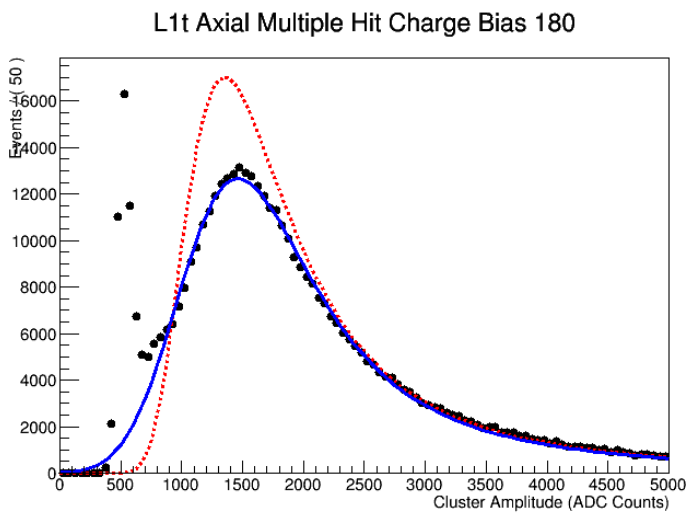


Sample Fits Multiple Hit Clusters

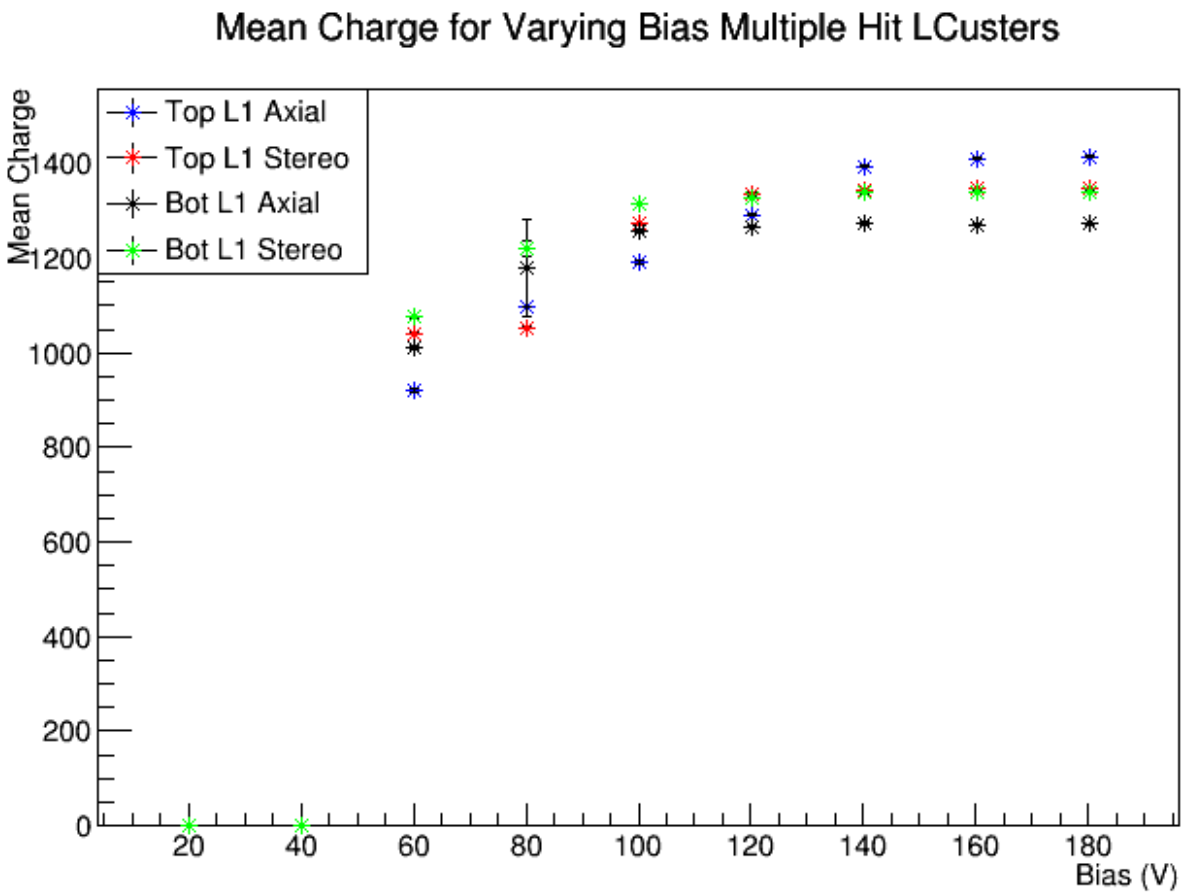




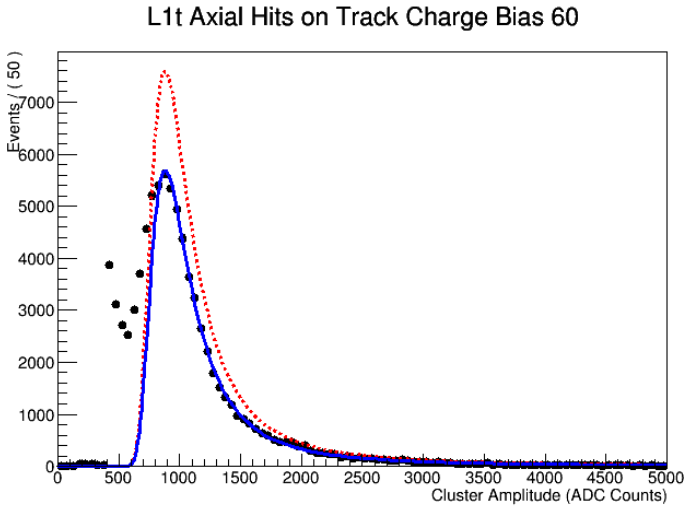


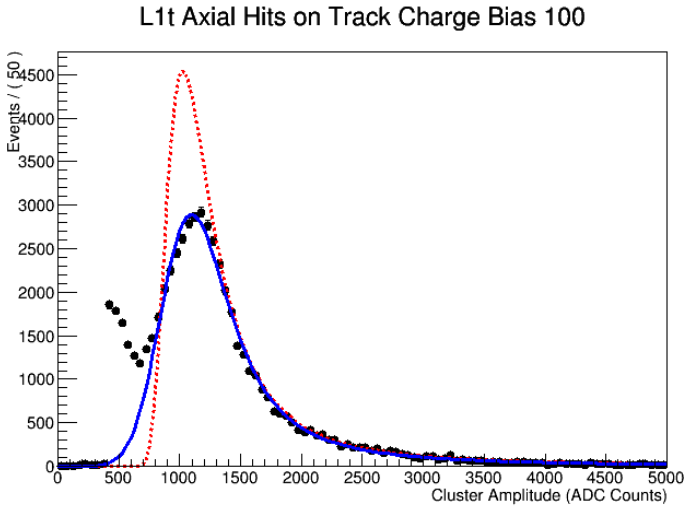


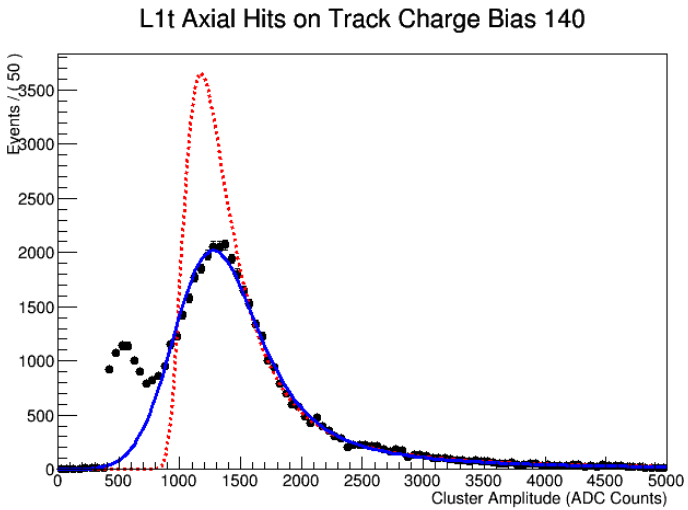
Bias Scans Multiple Hit Clusters

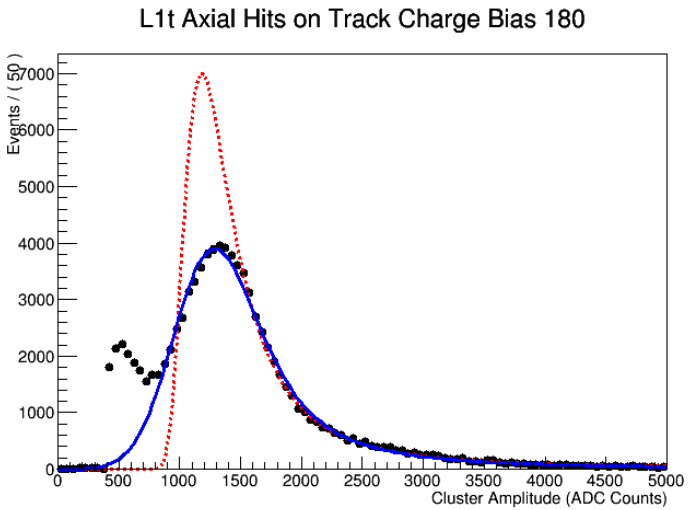


Sample Fits Clusters on Tracks

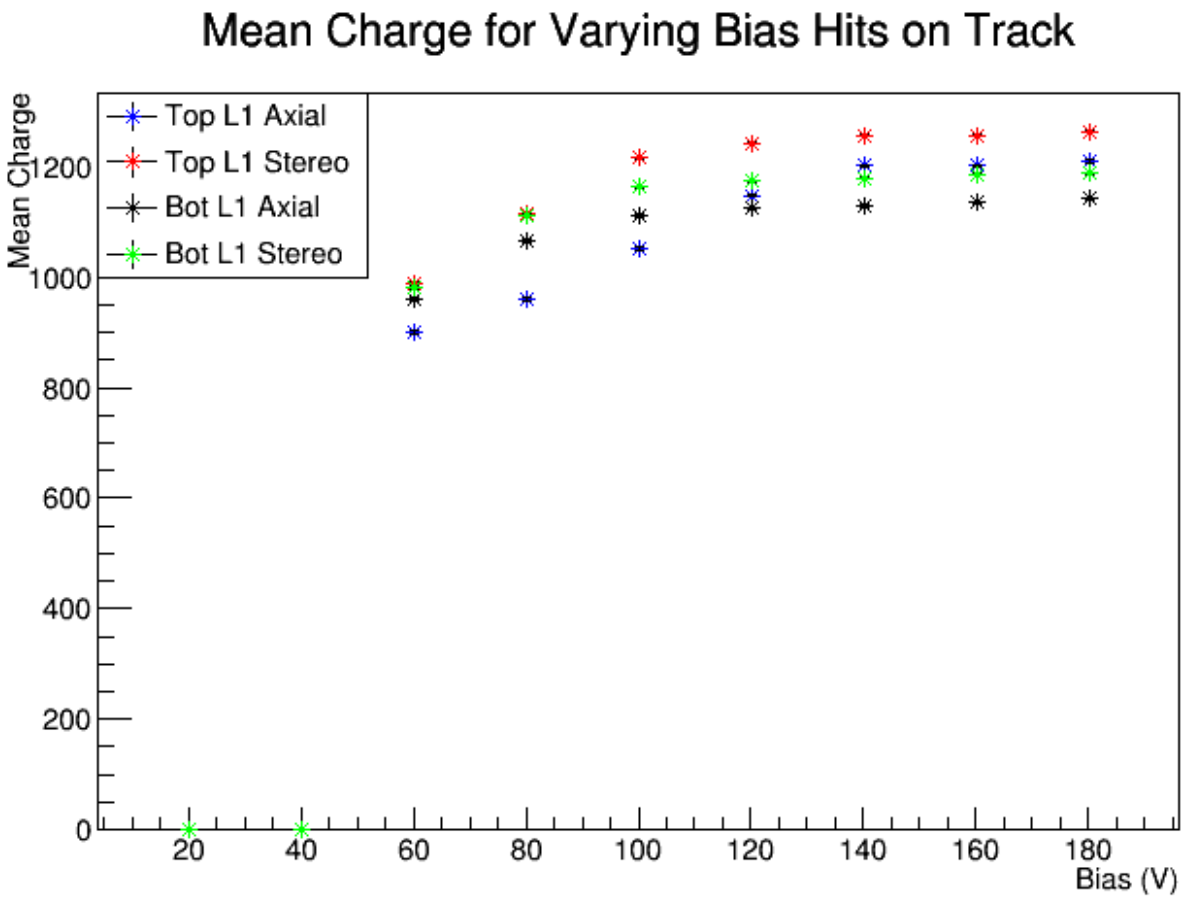




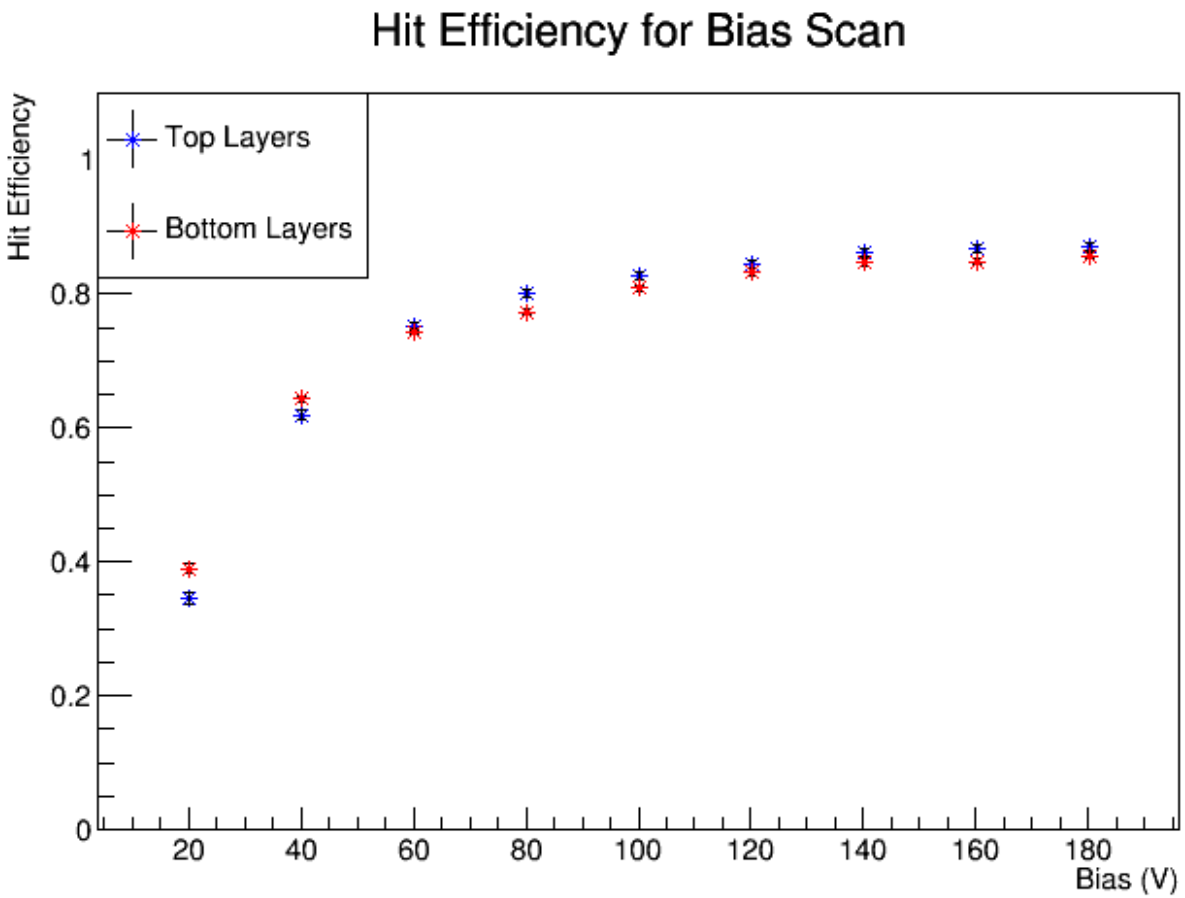




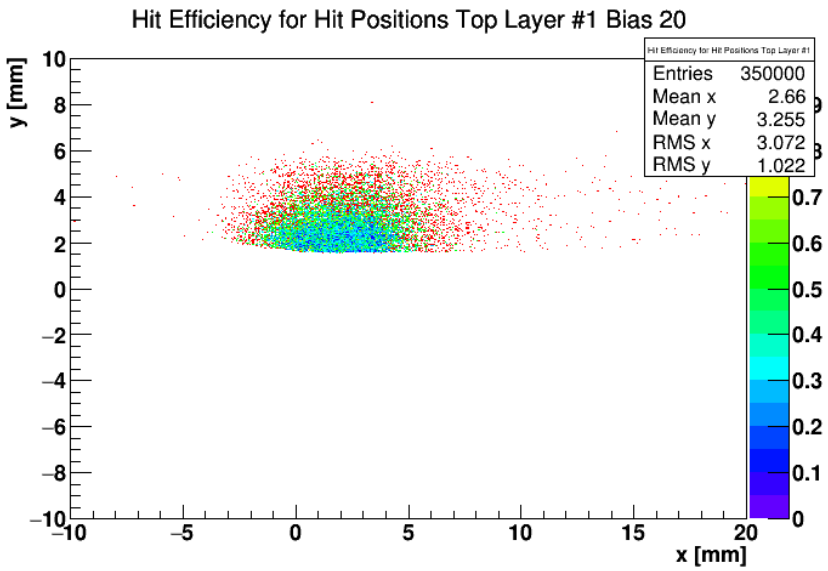
Bias Scans Clusters on Tracks

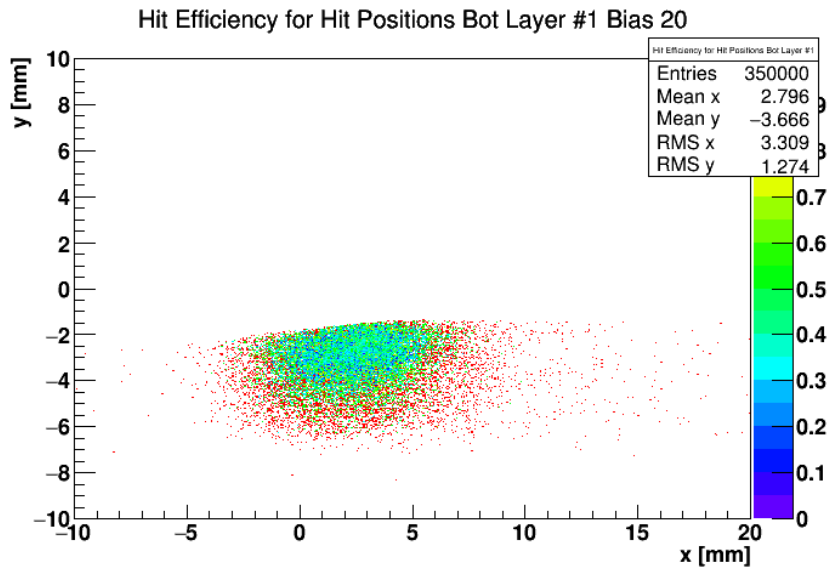


Bias Scans Hit Efficiency

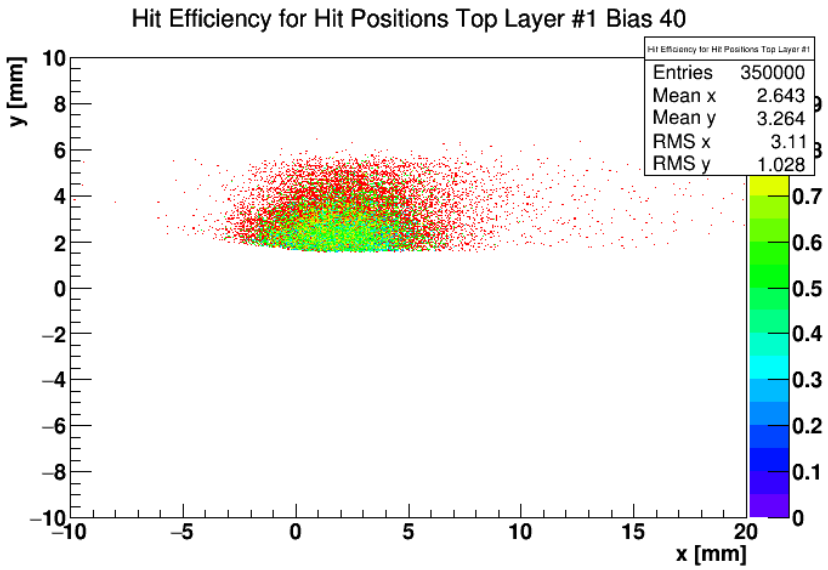


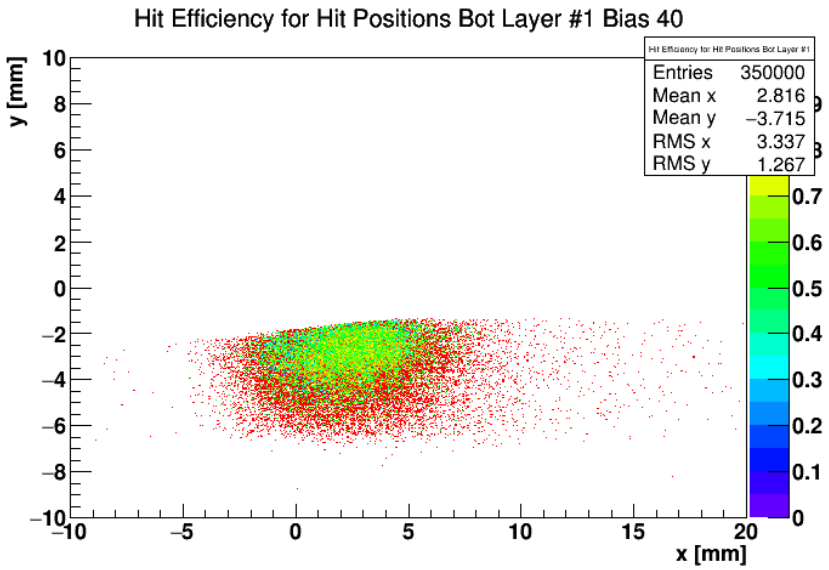
Bias Scans Hit Efficiency Bias 20 V



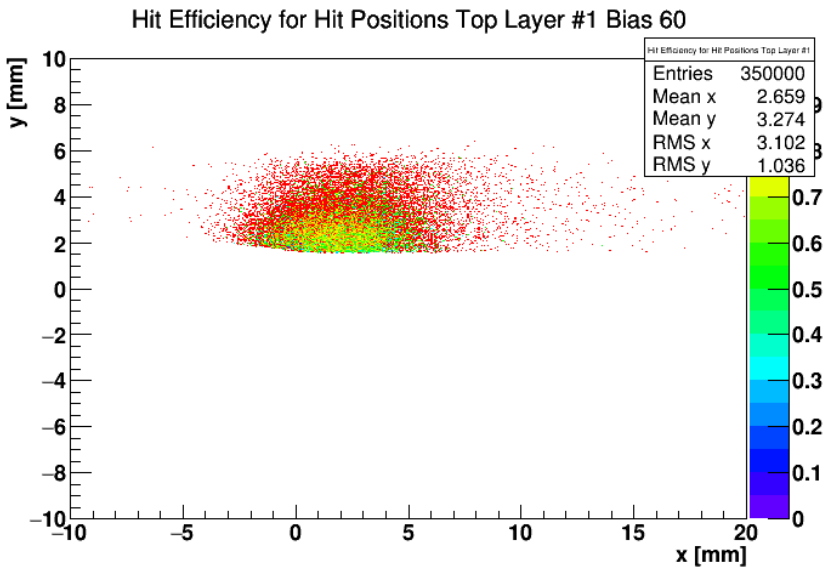


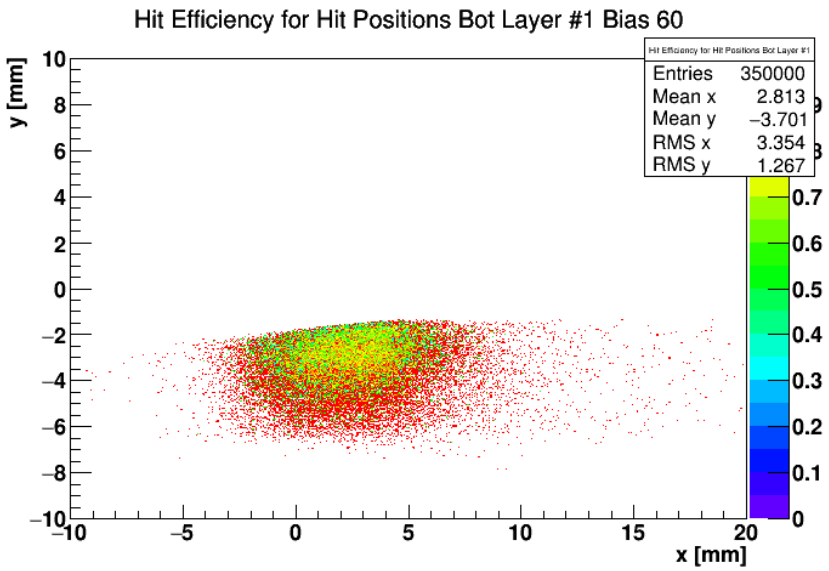
Bias Scans Hit Efficiency Bias 40 V



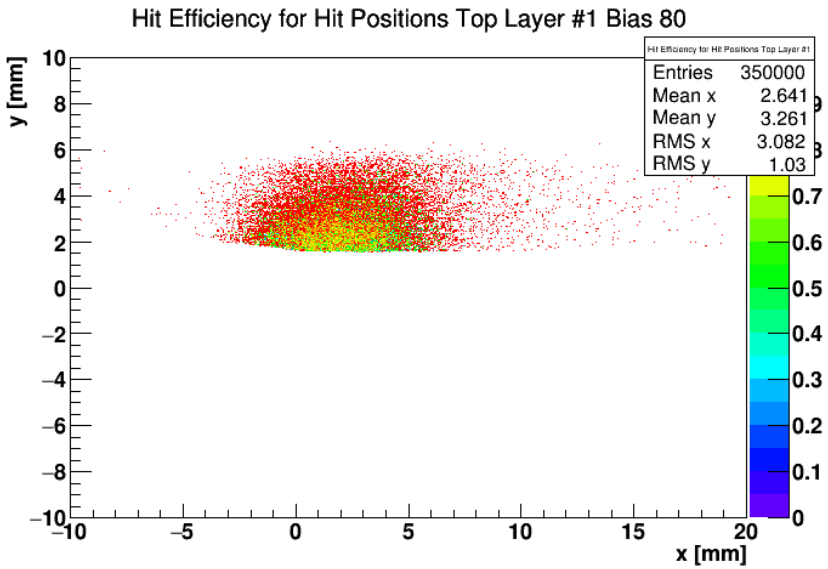


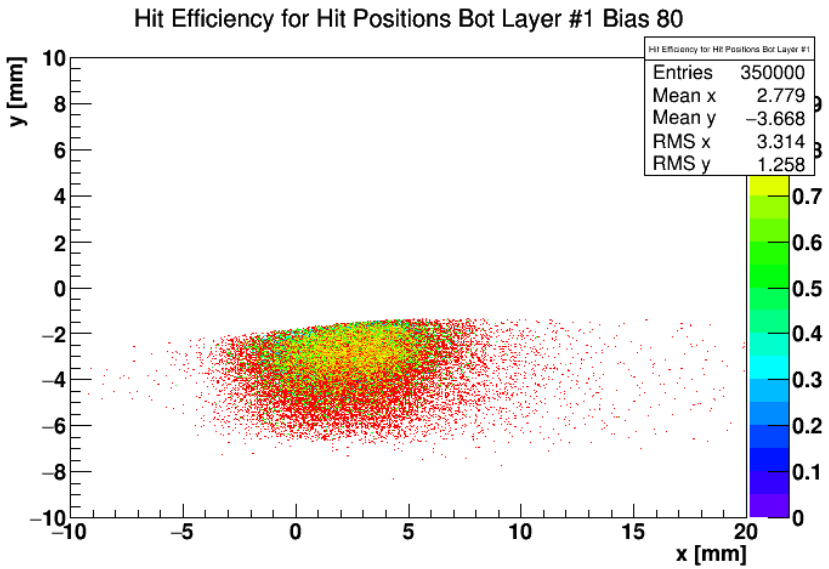
Bias Scans Hit Efficiency Bias 60 V



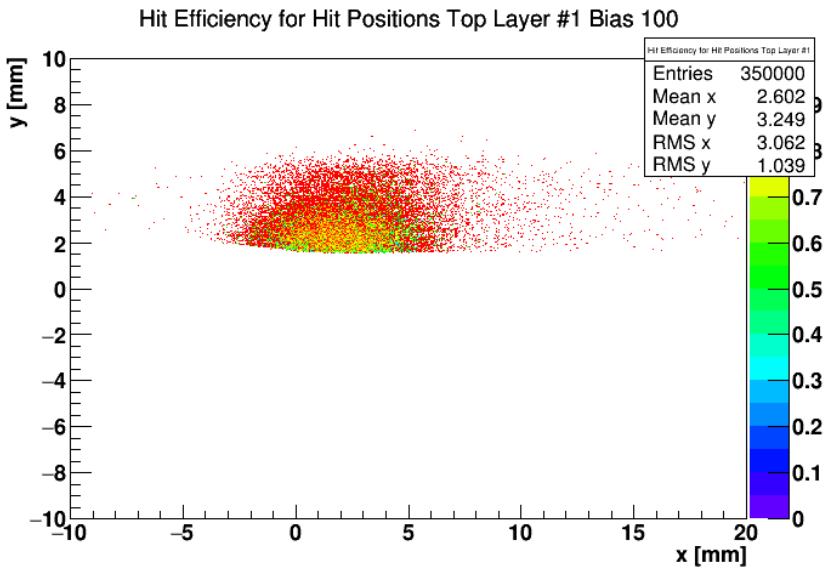


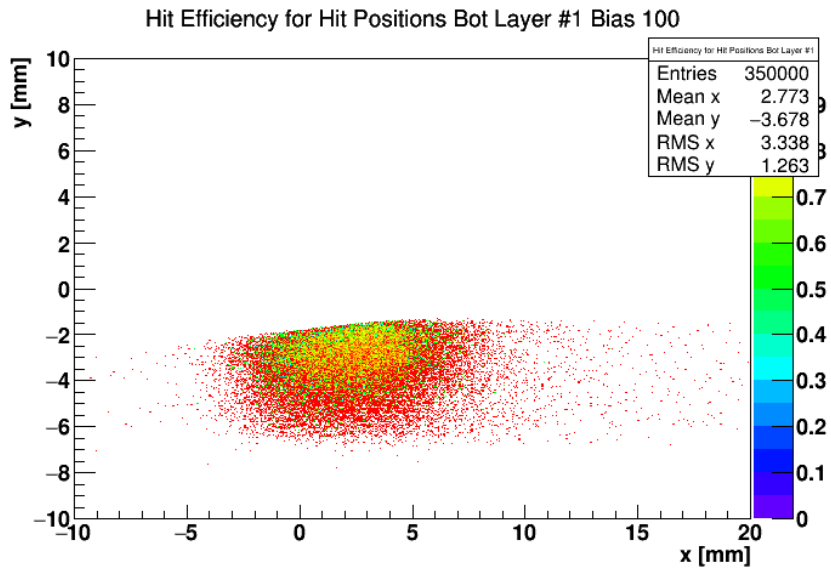
Bias Scans Hit Efficiency Bias 80 V



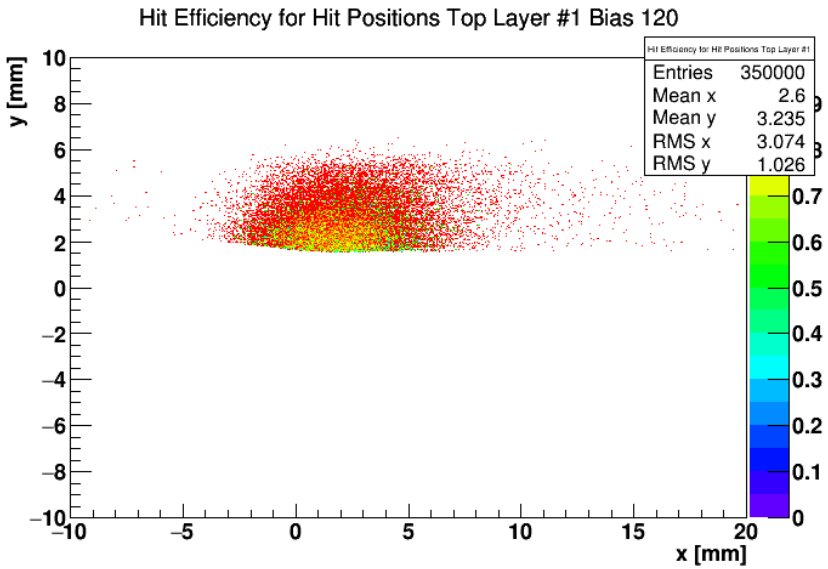


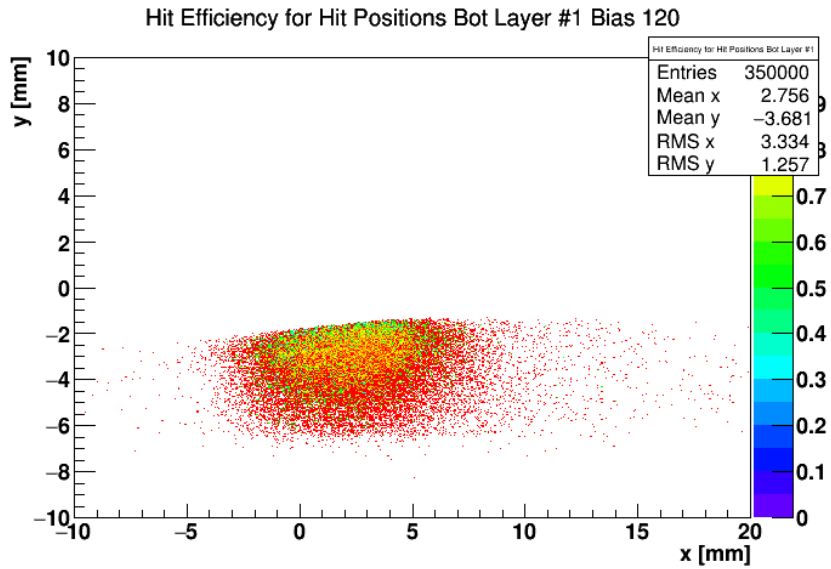
Bias Scans Hit Efficiency Bias 100 V



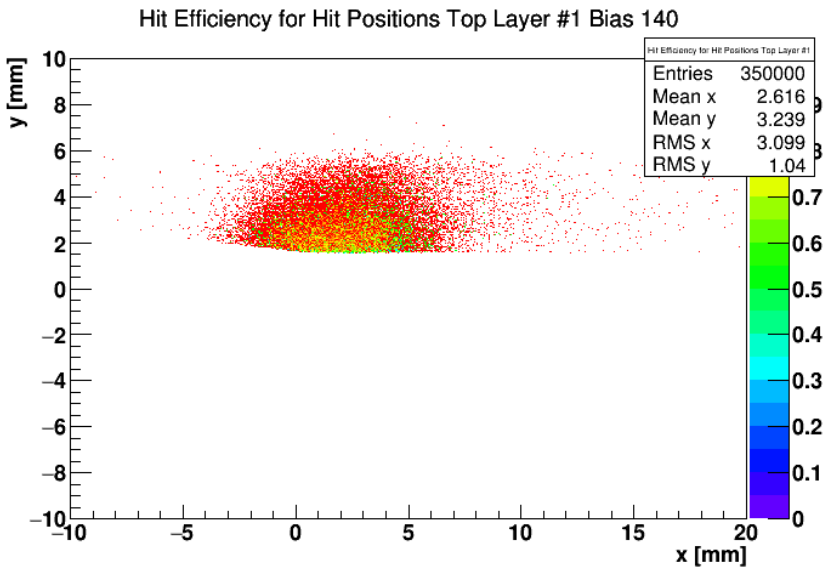


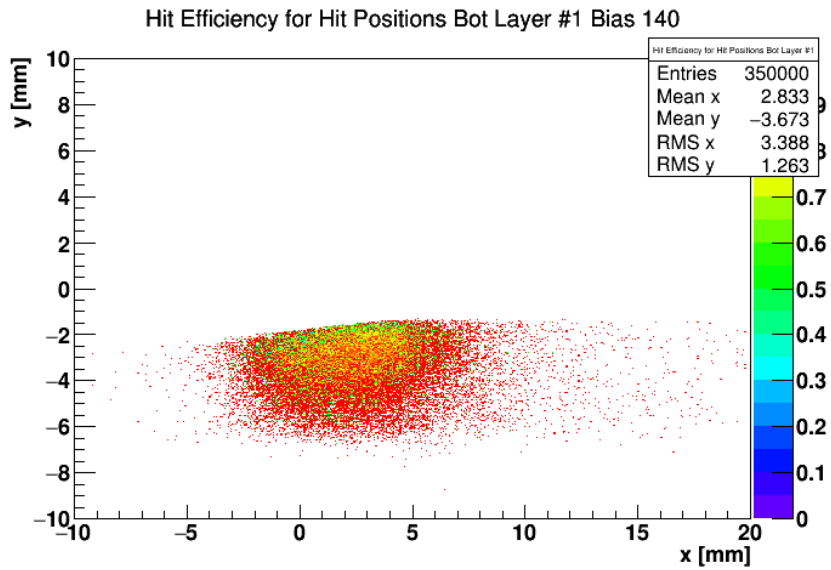
Bias Scans Hit Efficiency Bias 120 V



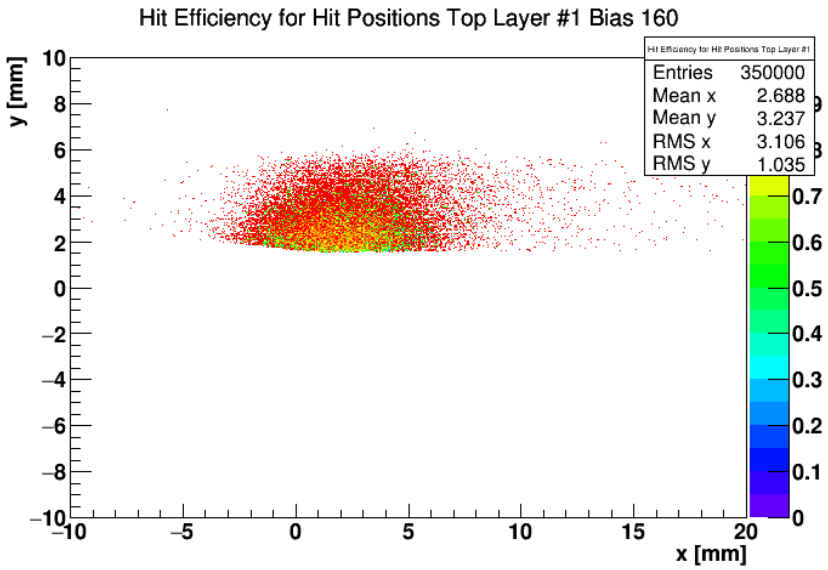


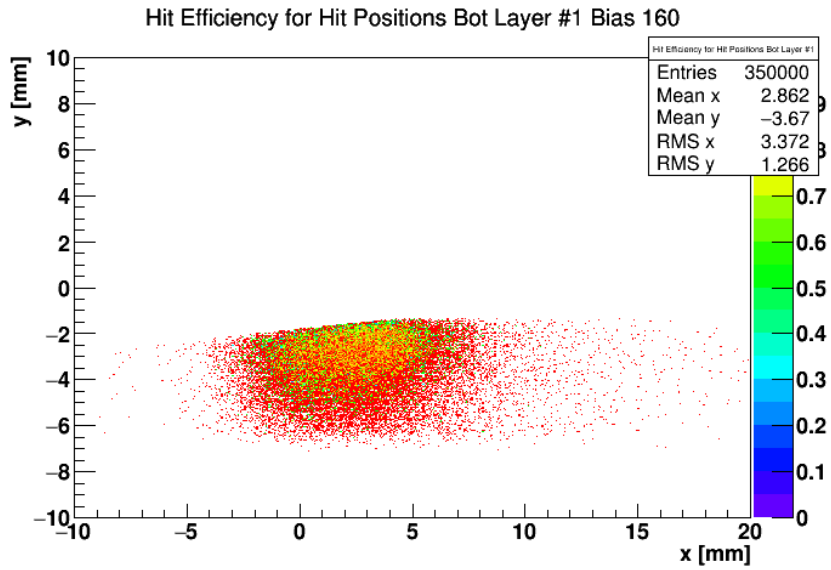
Bias Scans Hit Efficiency Bias 140 V



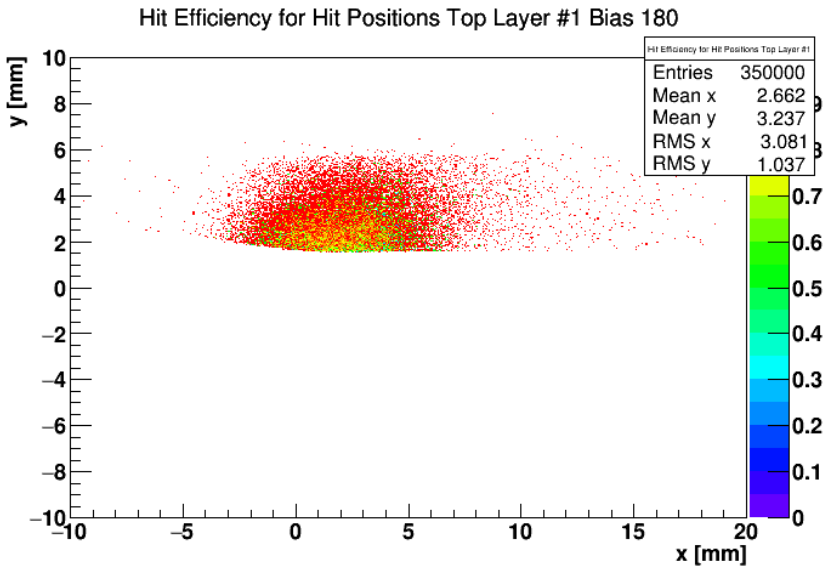


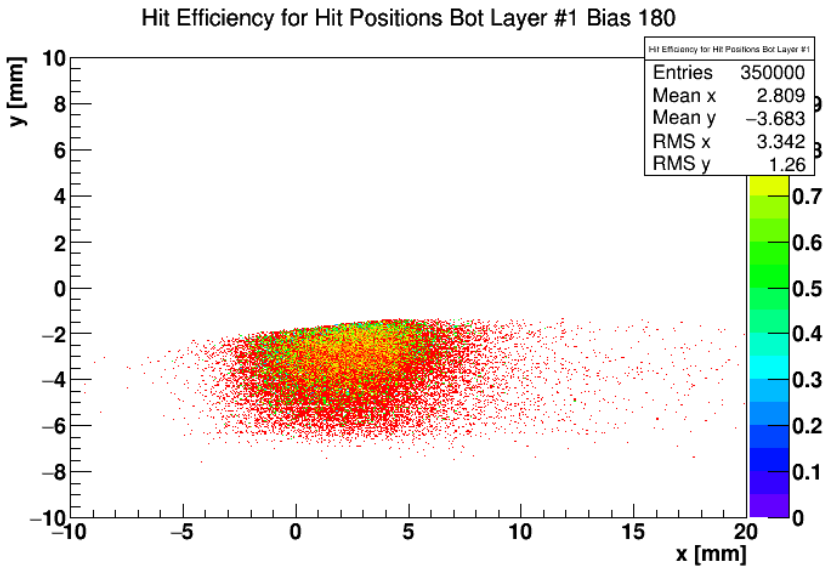
Bias Scans Hit Efficiency Bias 160 V





Bias Scans Hit Efficiency Bias 180 V





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