## 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



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# Sample Fits All Clusters



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## **Bias Scans All Clusters**



#### Mean Charge for Varying Bias

# Sample Fits Single Hit Clusters



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# Bias Scans Single Hit Clusters

Mean Charge for Varying Bias Single Hit Clusters



# Sample Fits Multiple Hit Clusters



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# Bias Scans Multiple Hit Clusters

Mean Charge 1001 1002 – Top L1 Axial Top L1 Stereo Bot L1 Axial \* Bot L1 Stereo \* 1000 800 600 400 200 0 20 40 60 80 100 120 160 180 140 Bias (V)

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



### 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