More on TPAC1.2 trimming

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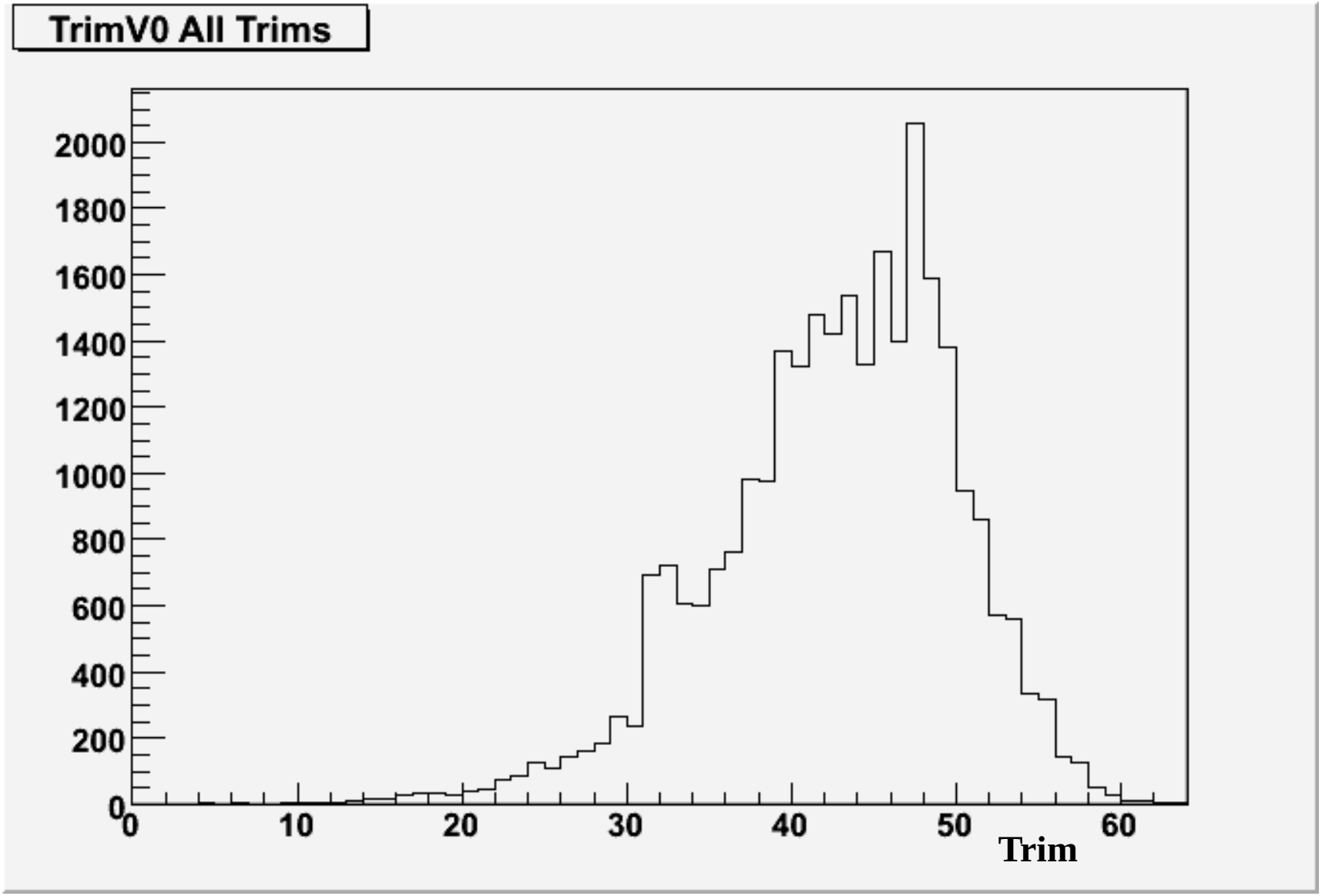
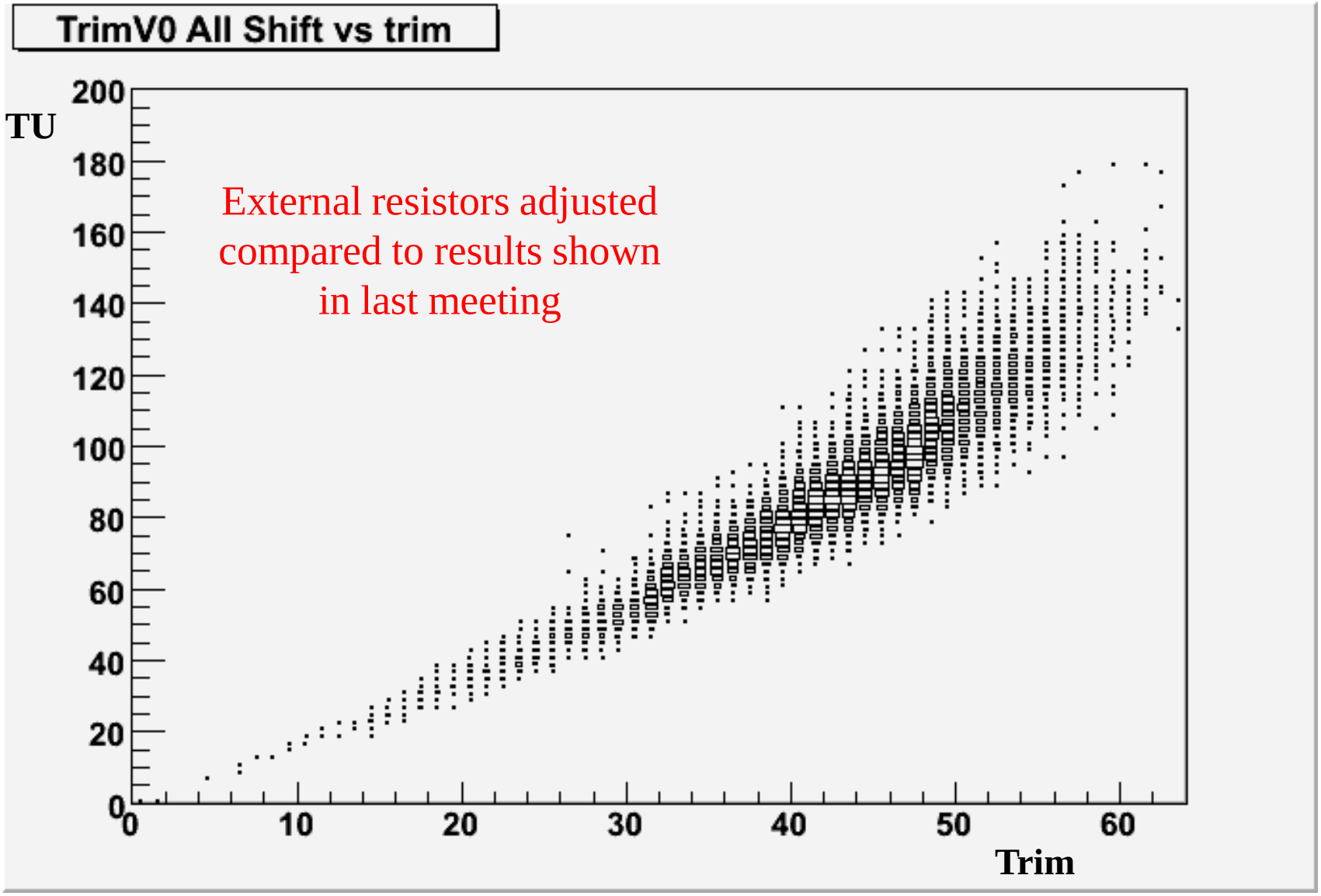
Trimmed sensors #29, #45, #46, #48

- Same method as before
  - Fix trims to some values
  - Unmask 42 pixels per readout region
  - 4 regions = 168 pixels total in each run
  - Do threshold scan to determine mean and width
  - Do 168 runs to cover complete sensor
- Adjust trim to narrow mean distribution
  - Picked target for pixel mean = 100TU for all sensors
  - Adjust trims using binary division of remaining range for each pixel
  - Needs six set of runs to fix all six bits
- Following completed trim, run with ~all pixels unmasked
  - Threshold scan similar to “real” running

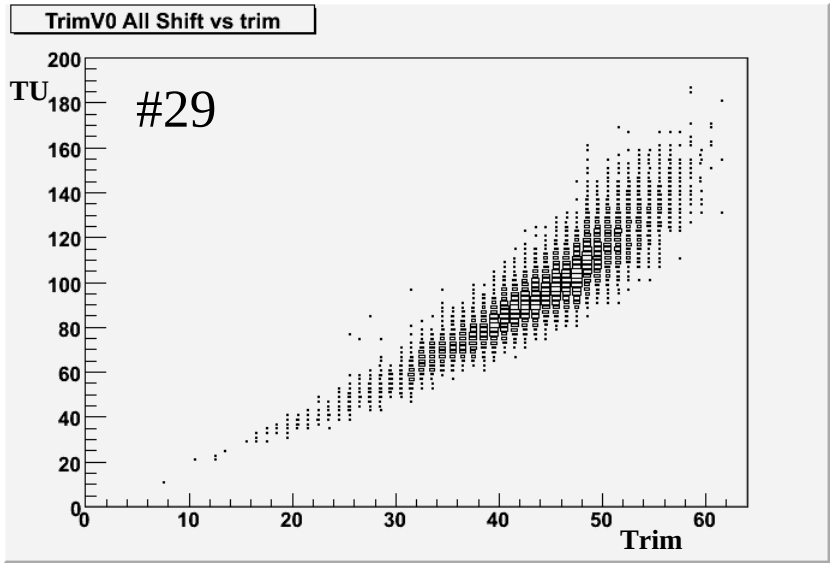
Sensor #29 trim values

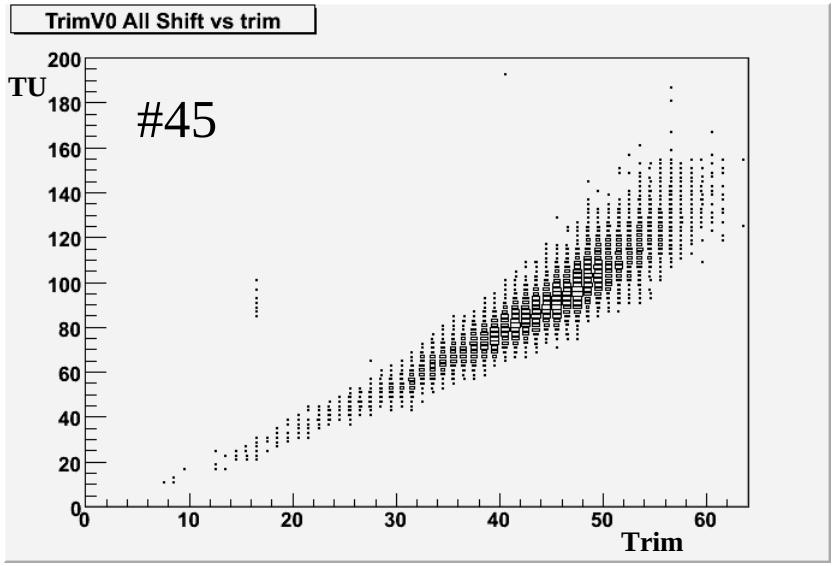


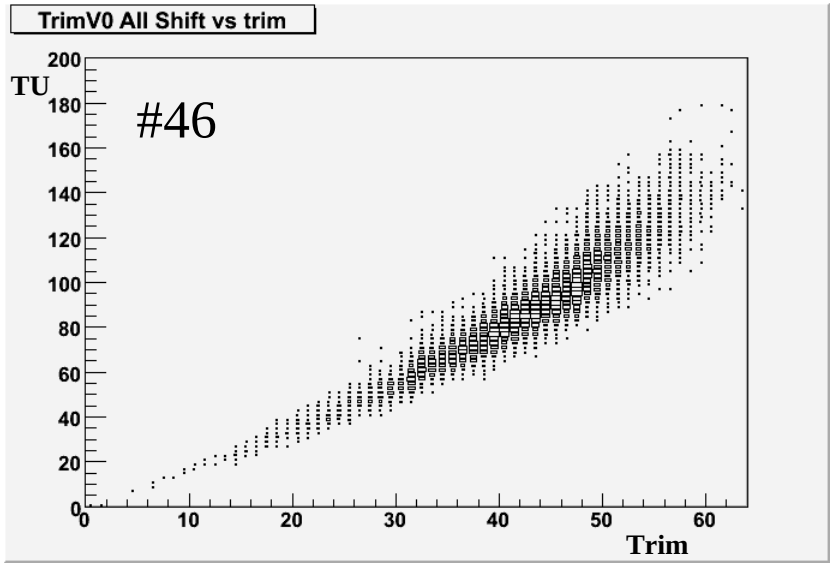
Sensor #29 shift relative to trim=0

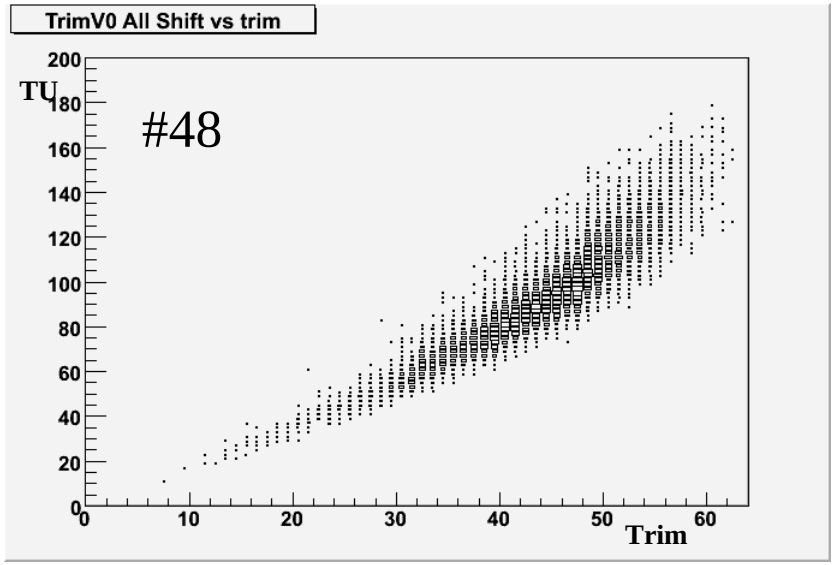


Similar for all four sensors

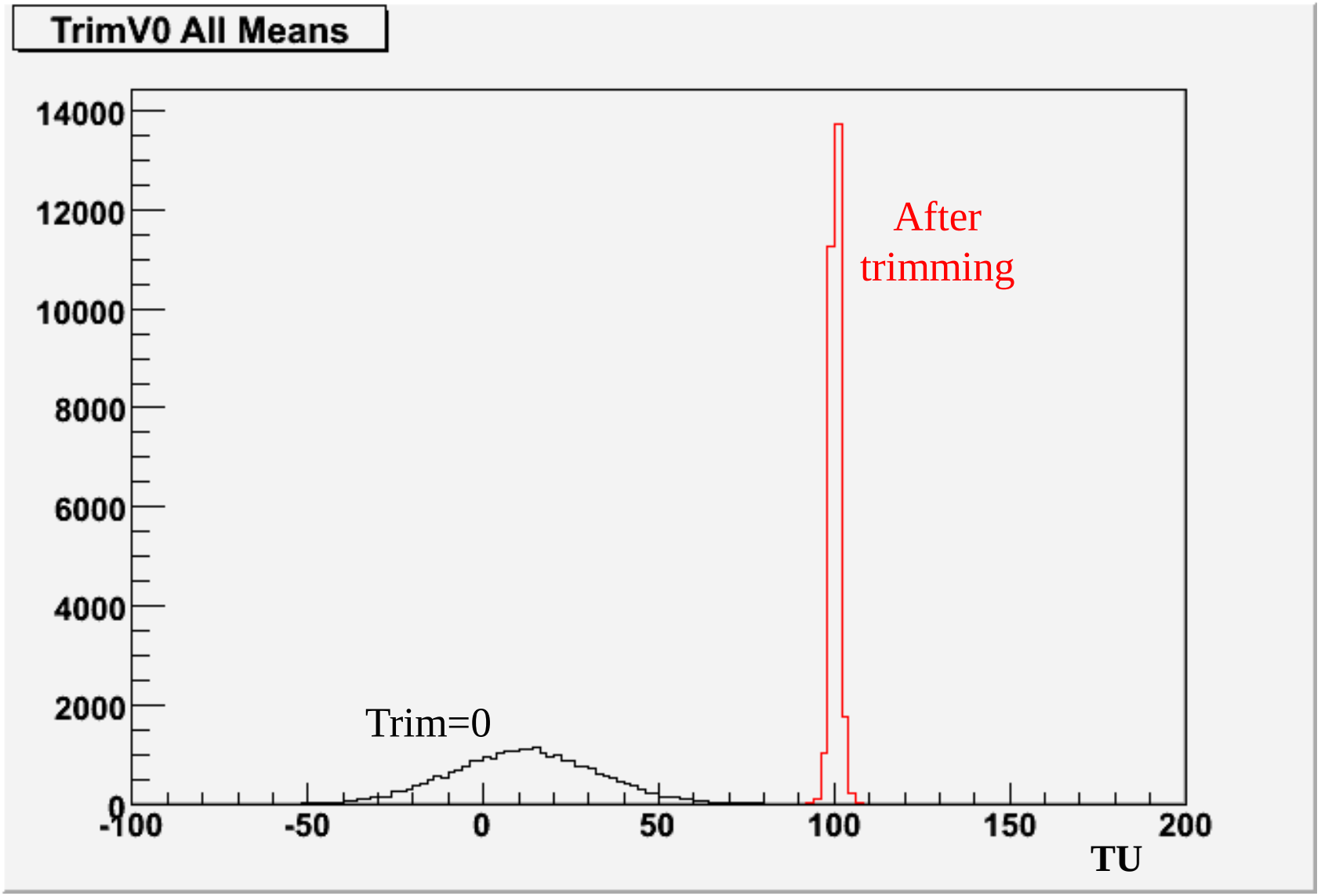




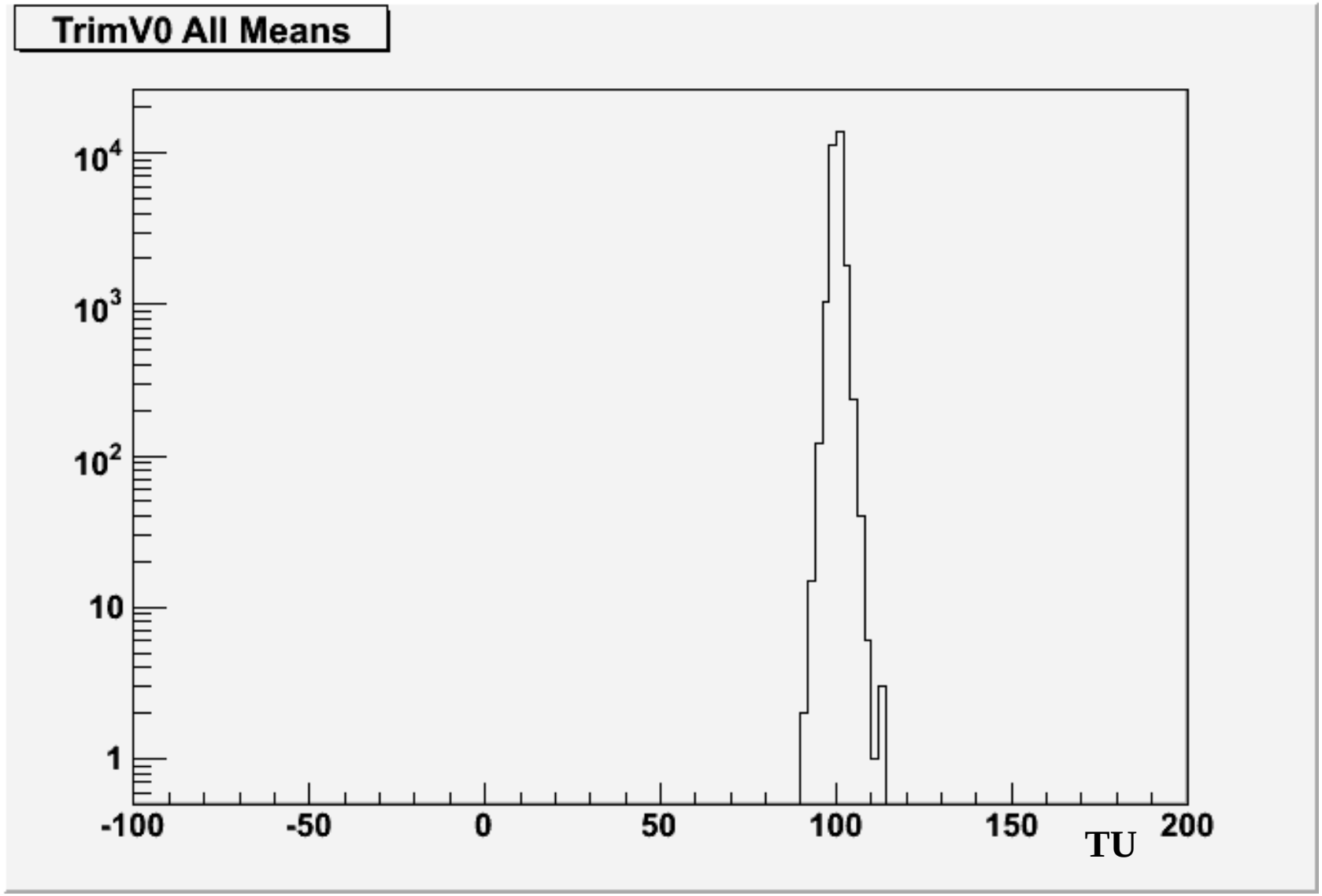




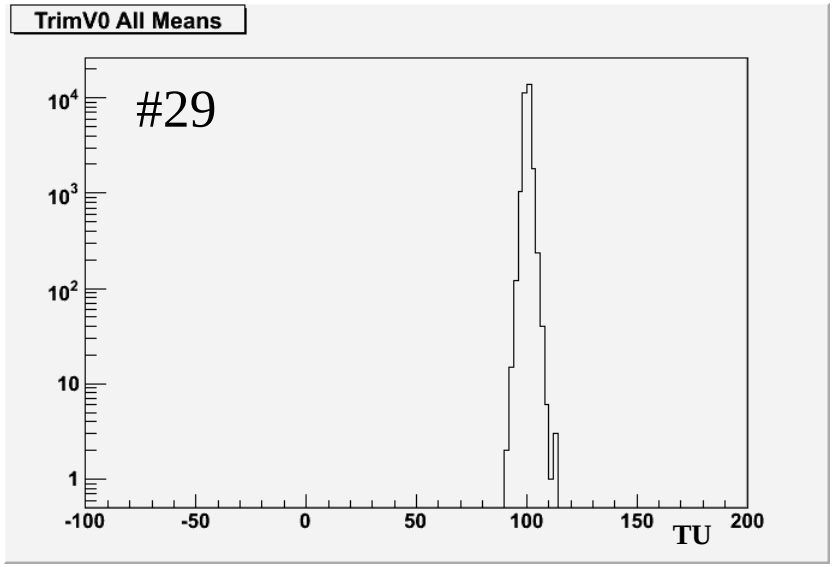
Sensor #29 effect of trimming on mean

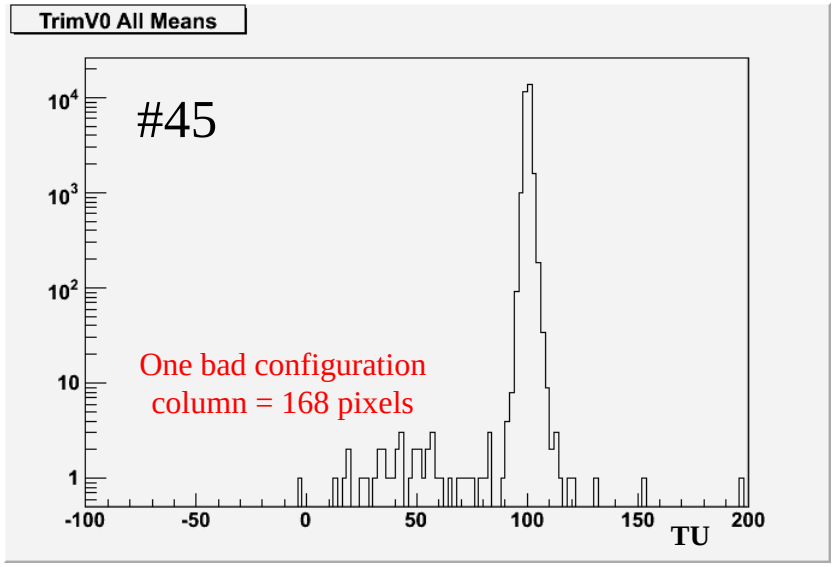


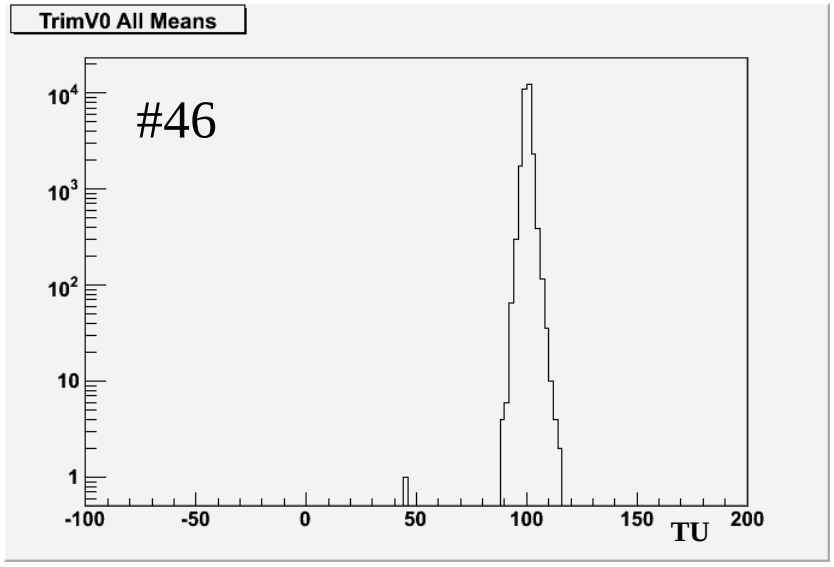
Sensor #29 mean (cont)

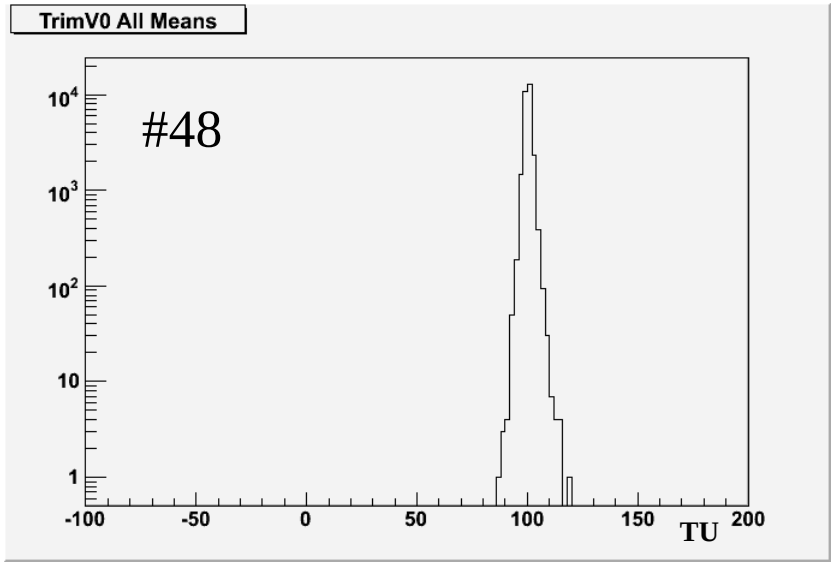


Similar for all four sensors

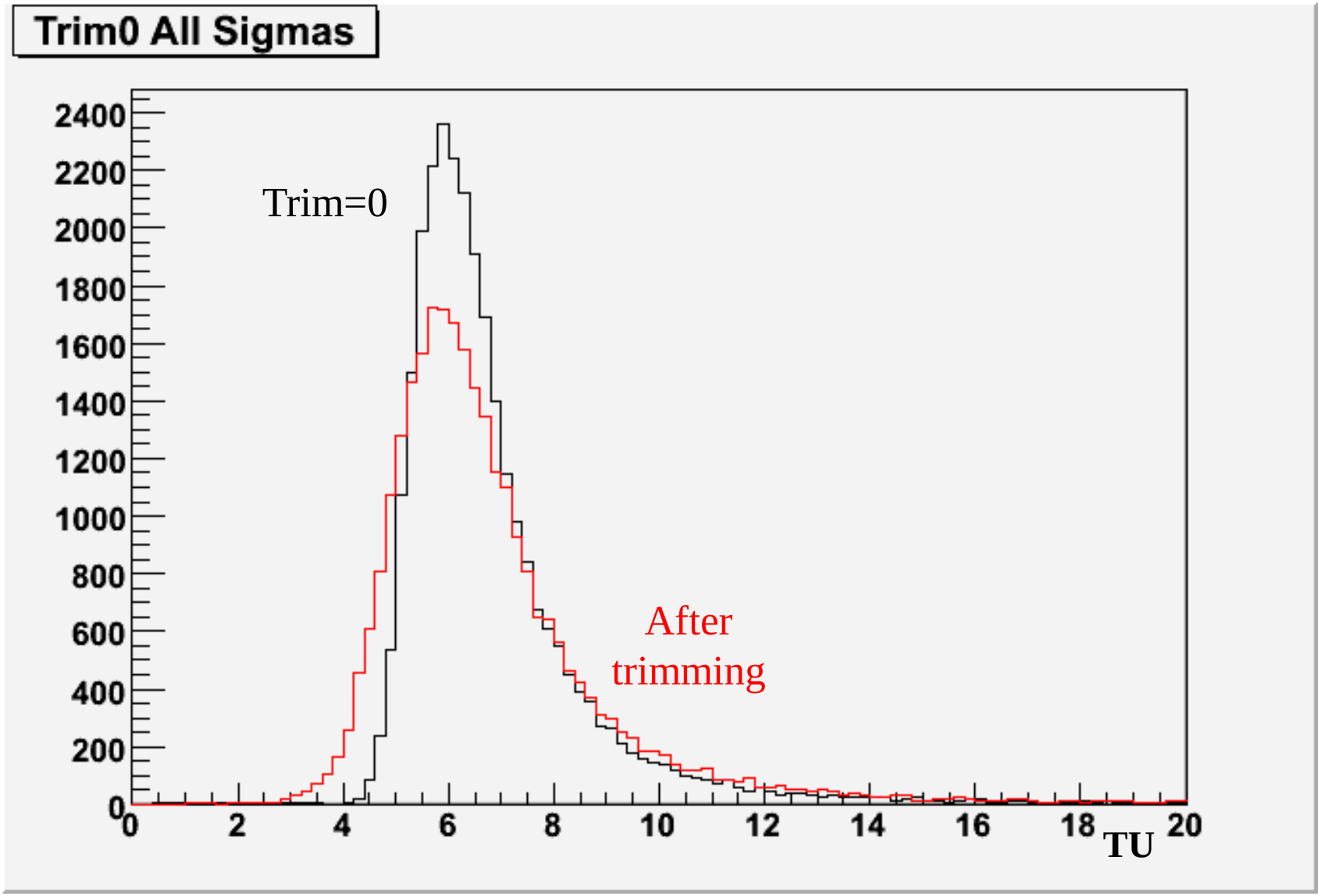




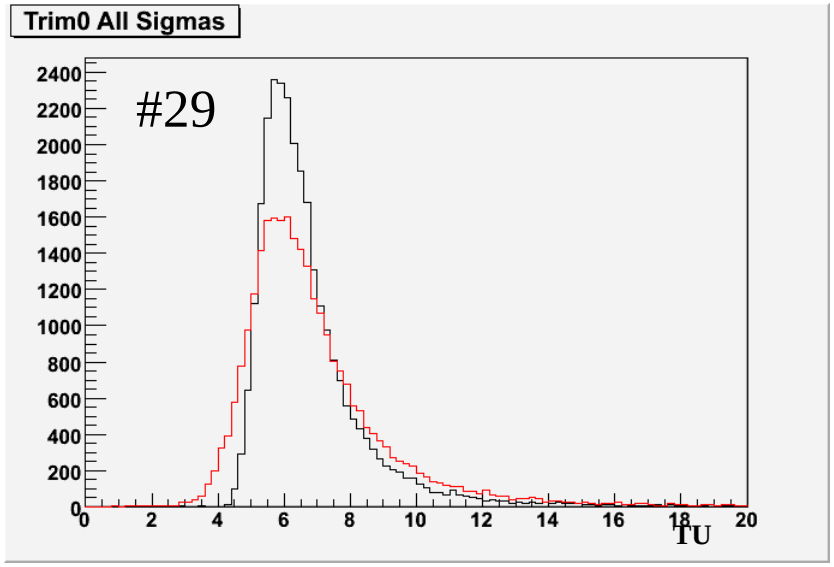


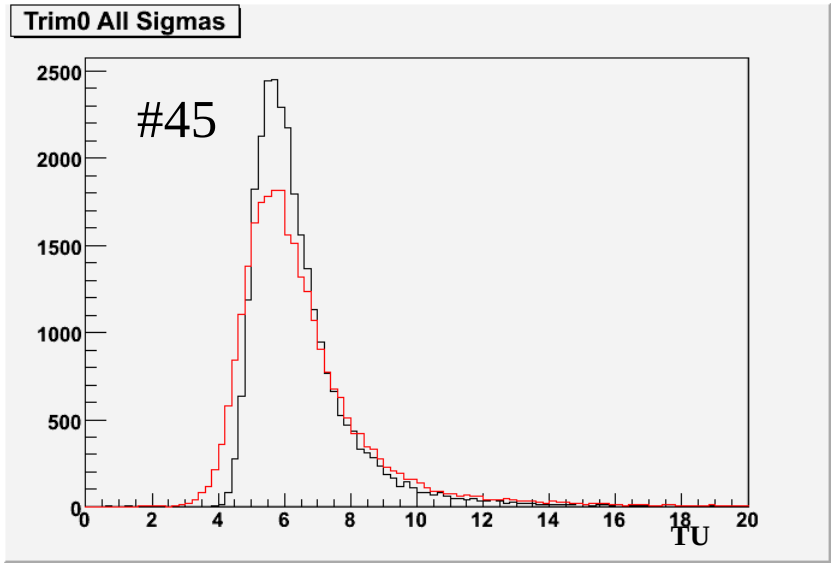


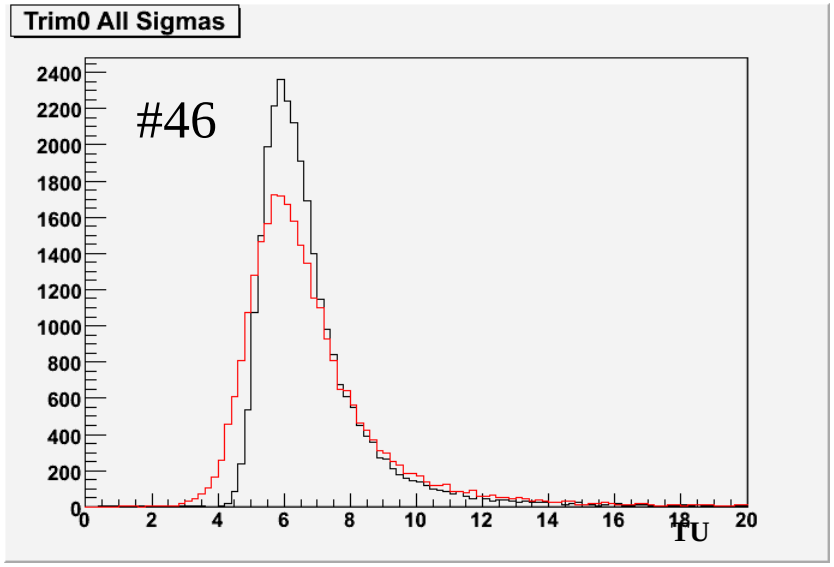
Sensor #29 effect of trimming on RMS

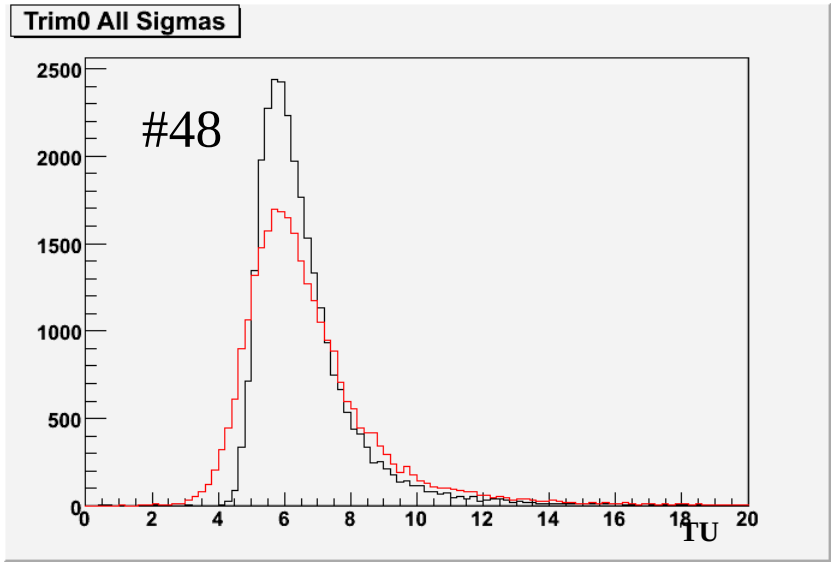


Similar for all four sensors

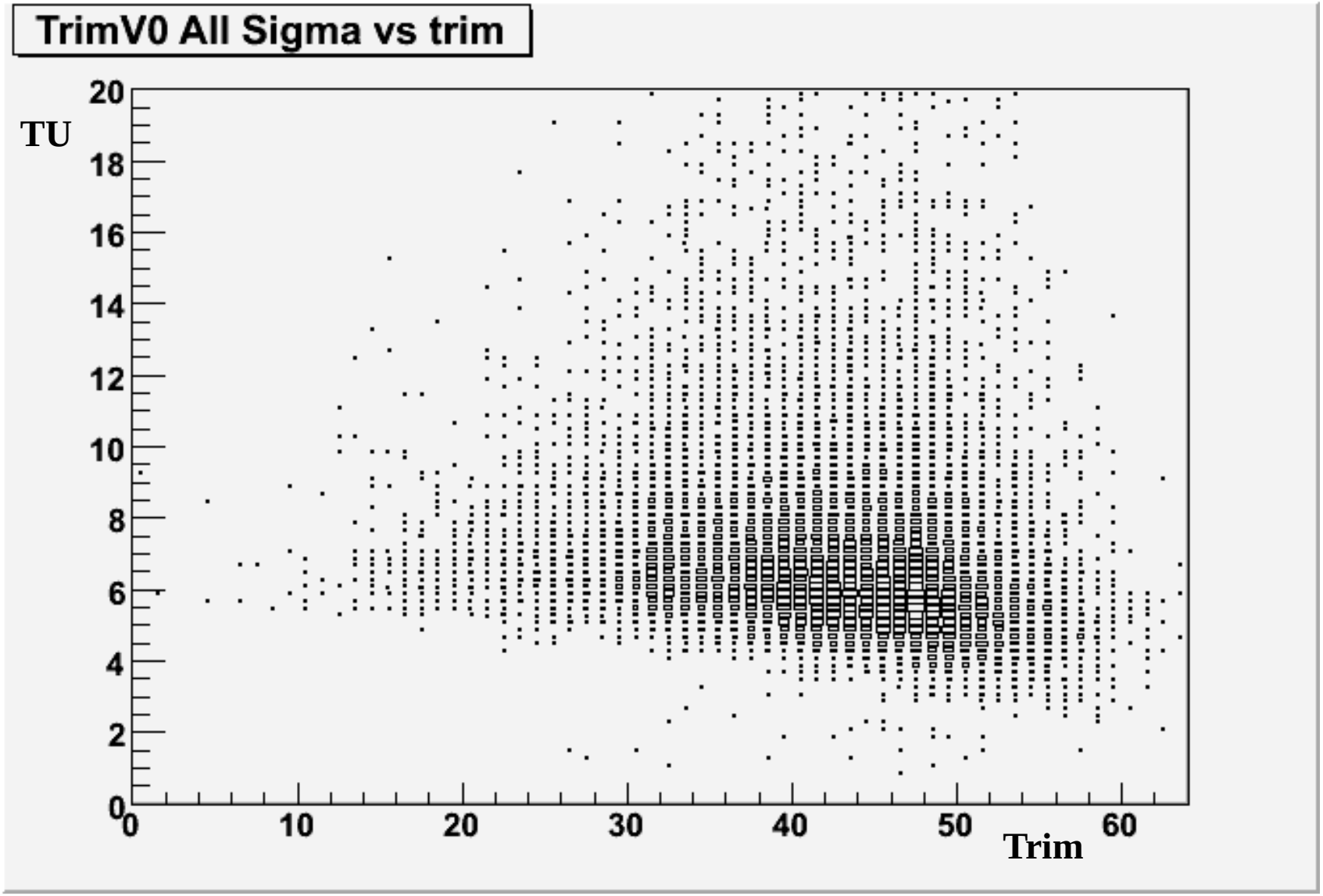




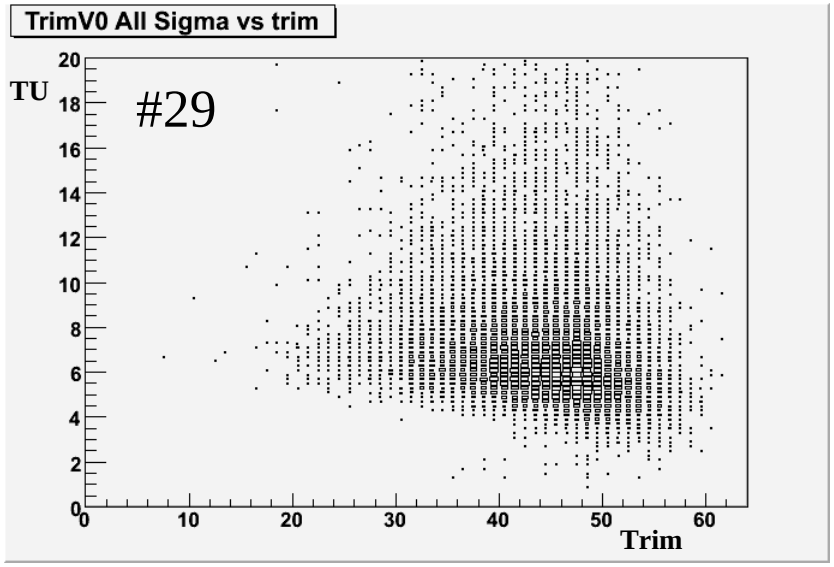


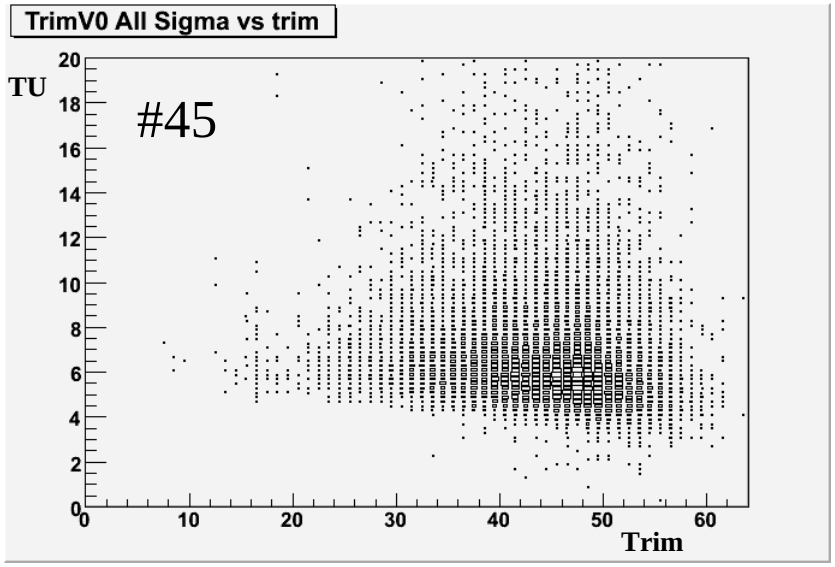


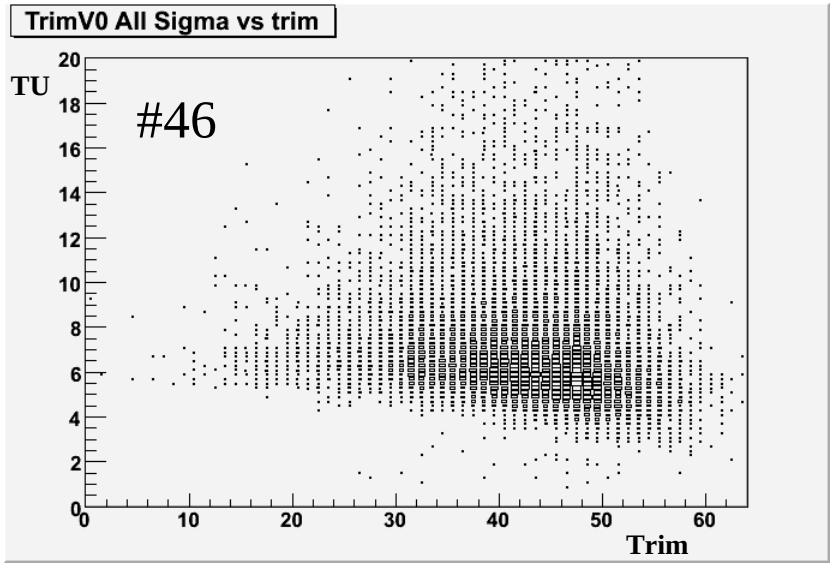
Sensor #29 dependence of RMS on trim

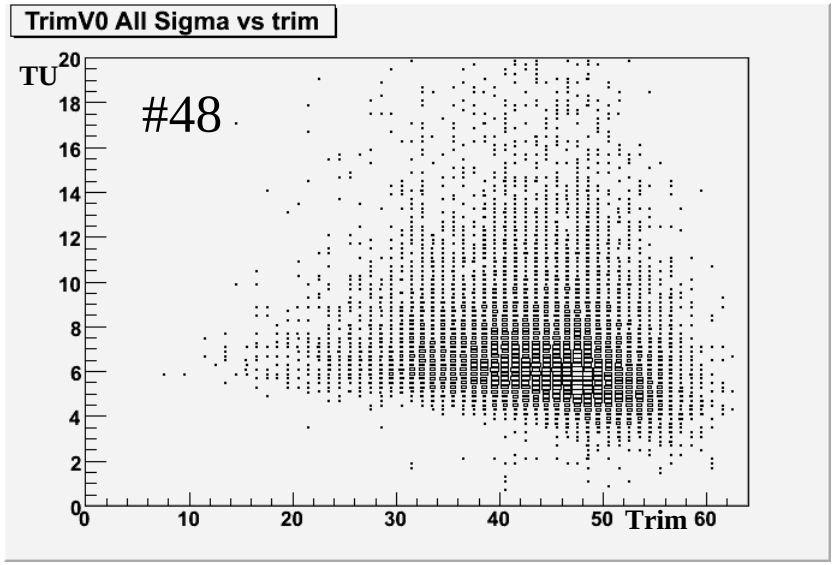


Similar for all four sensors

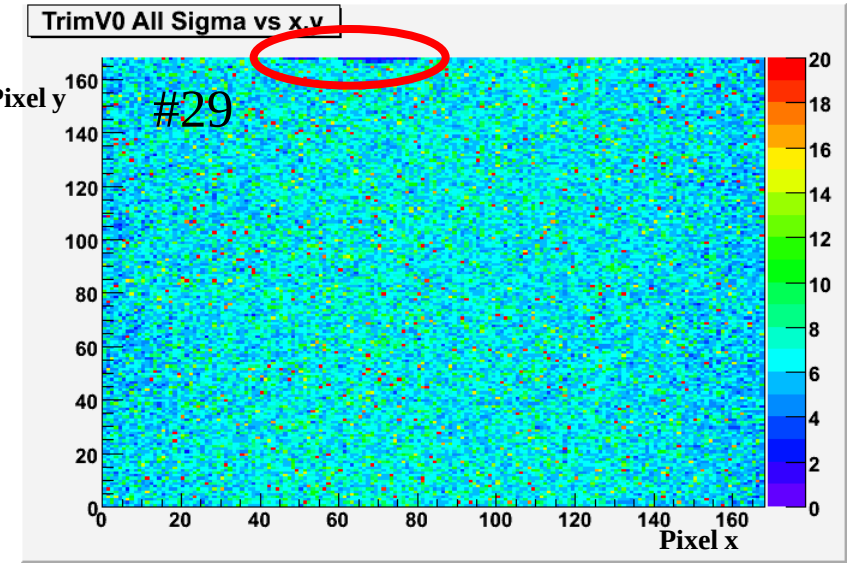


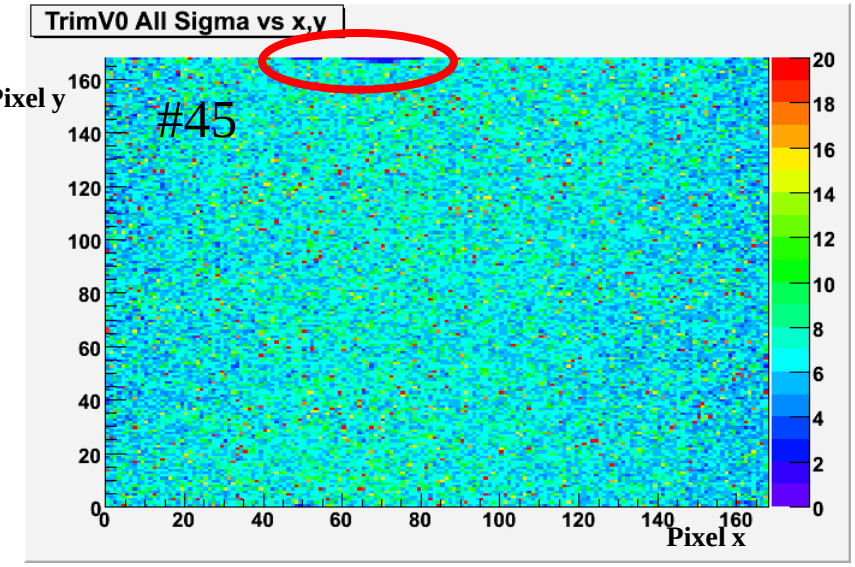


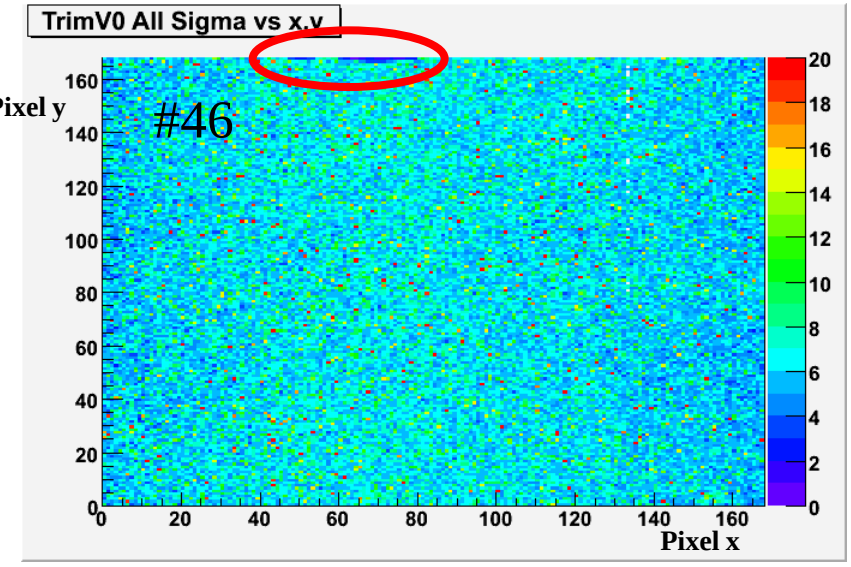


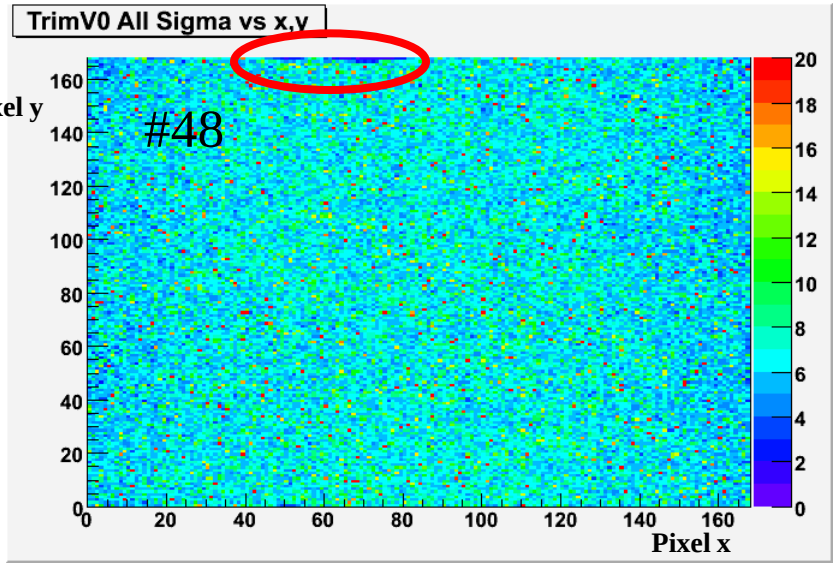


Position dependence of RMS

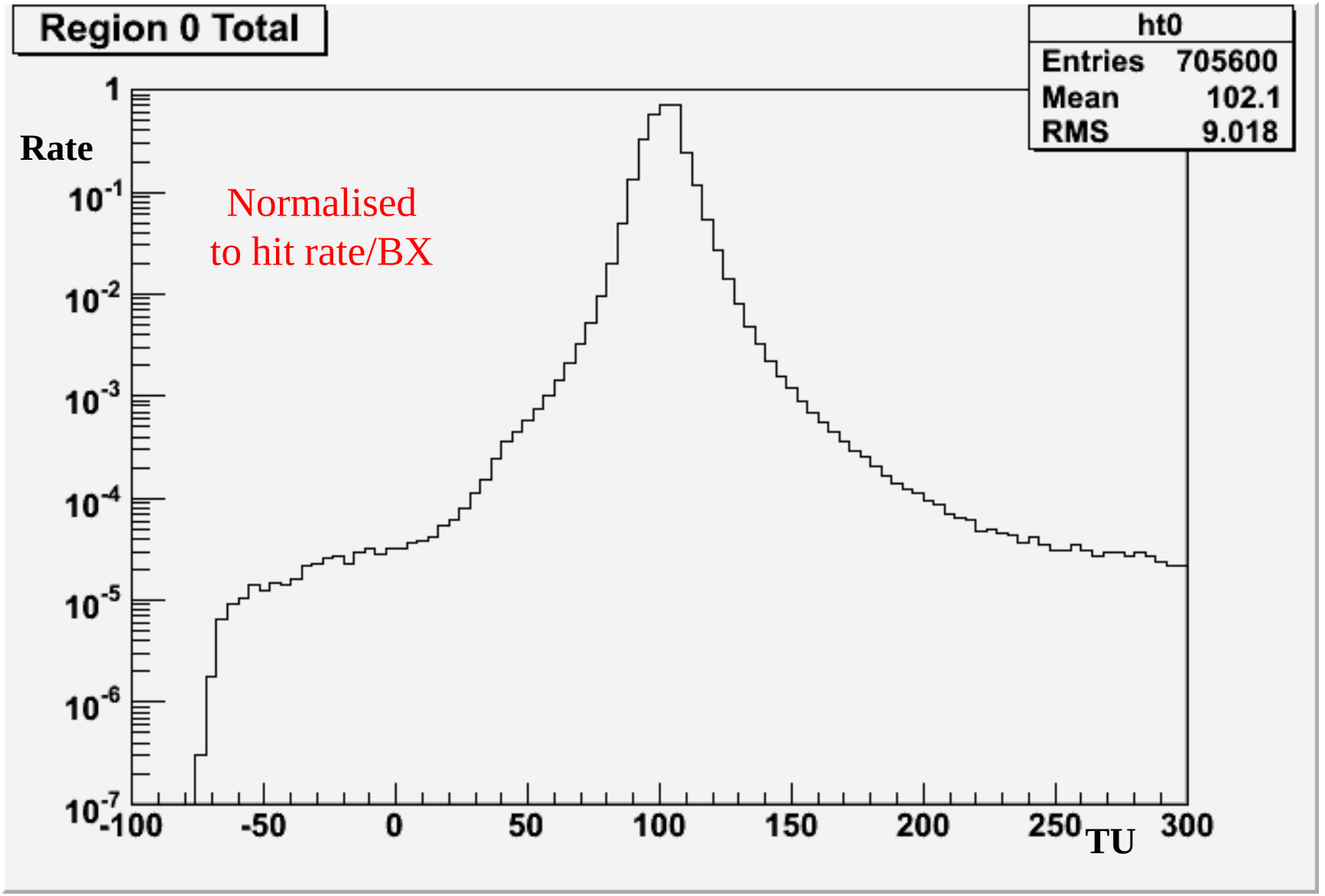




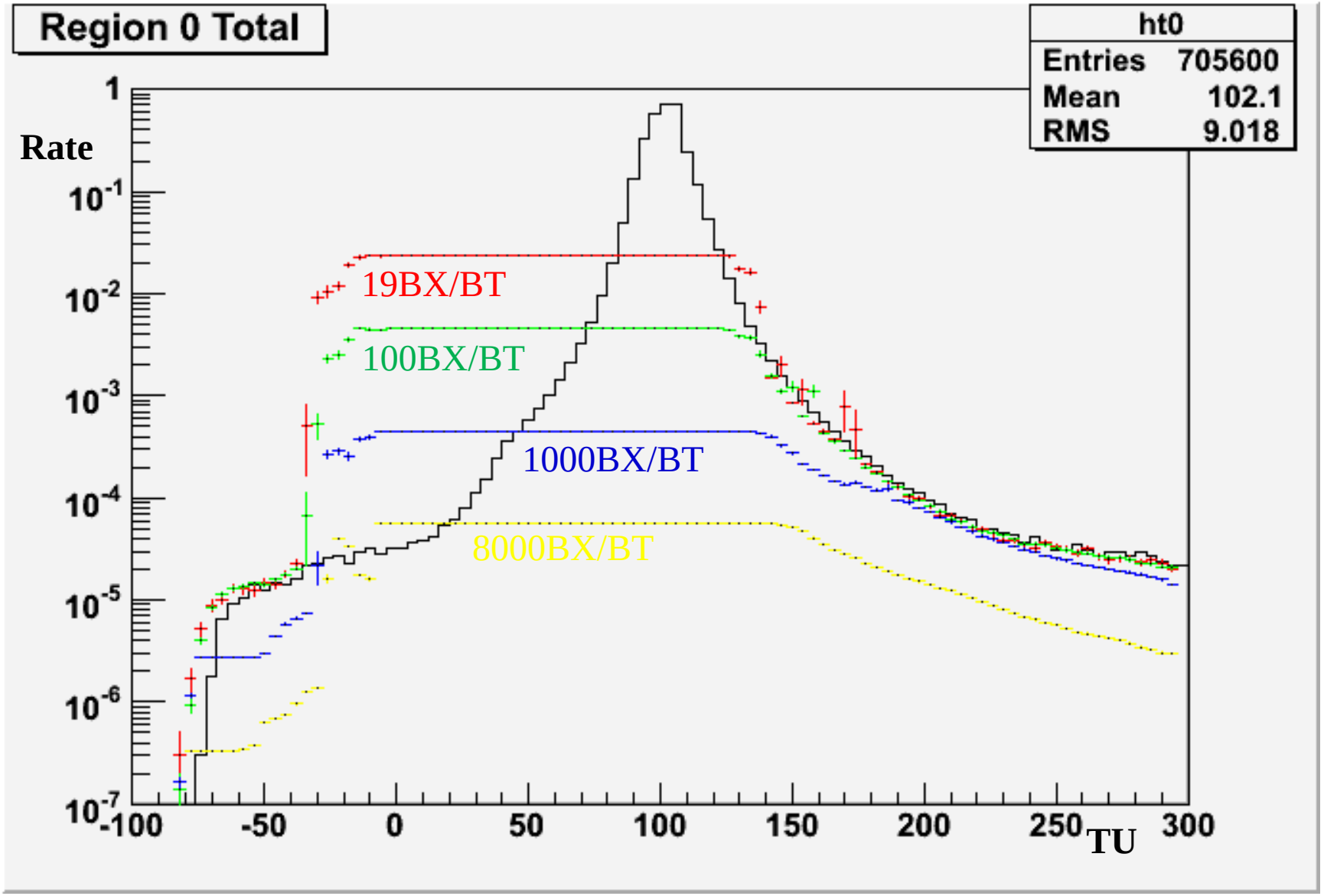




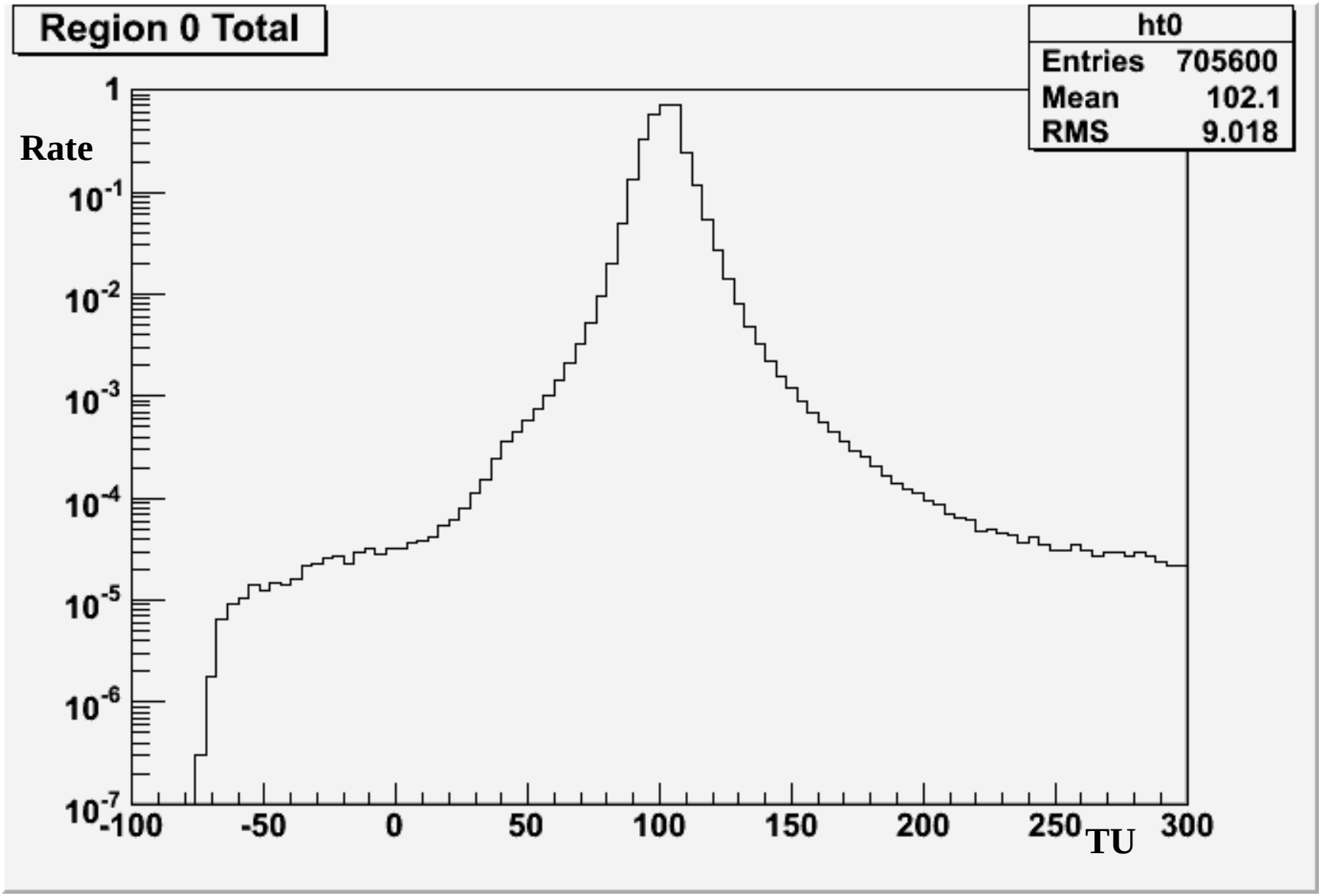
Sum of all region 0 hits from trim runs



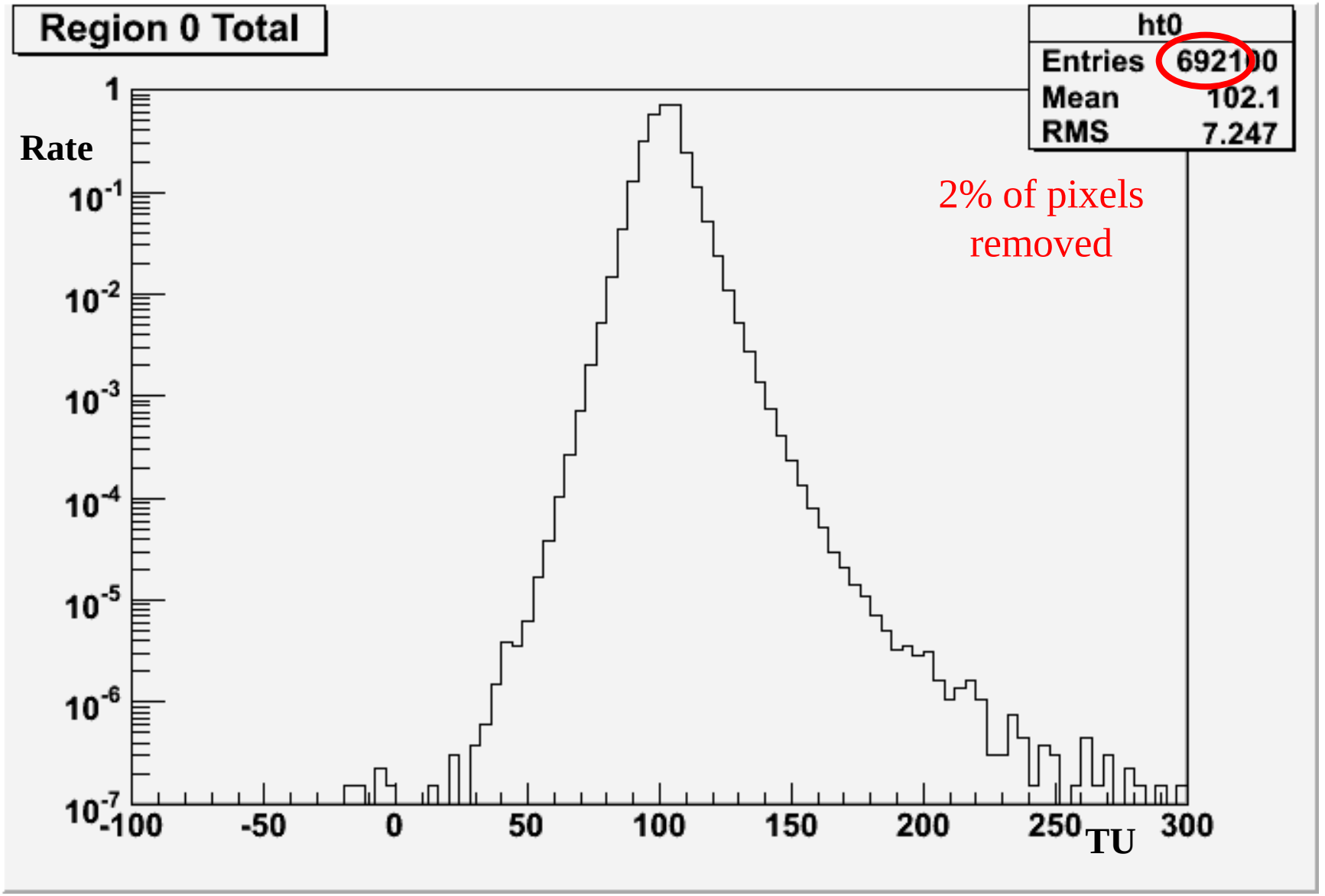
Rate from runs with all pixels unmasked



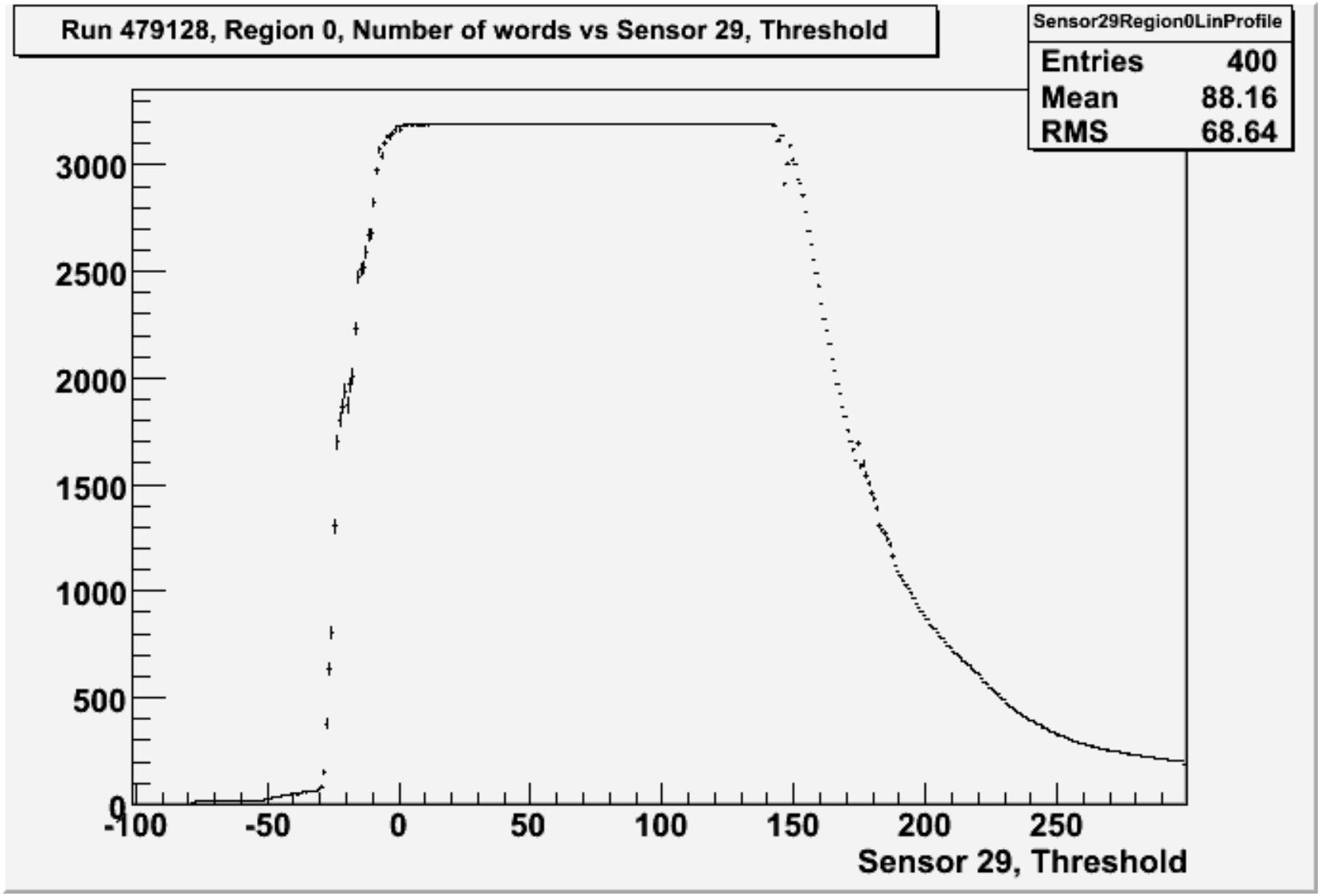
Sum of all hits again



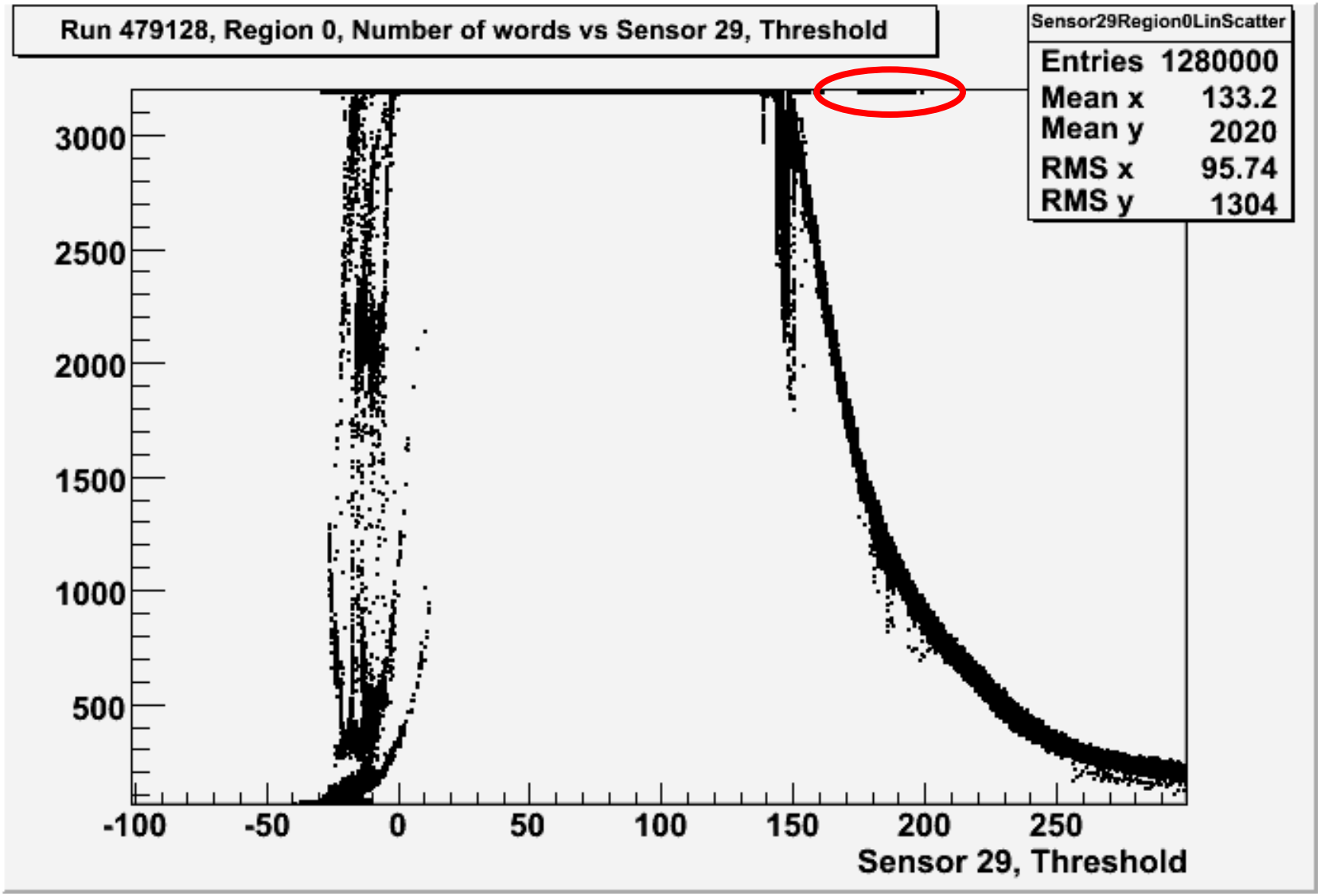
Exclude pixels with RMS > 15TU



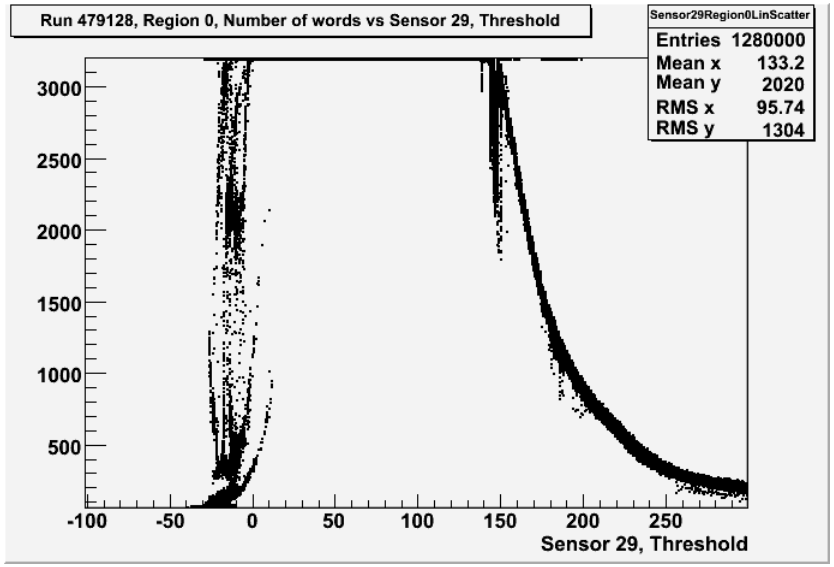
Unmasked runs for 8000BX/BT; mean

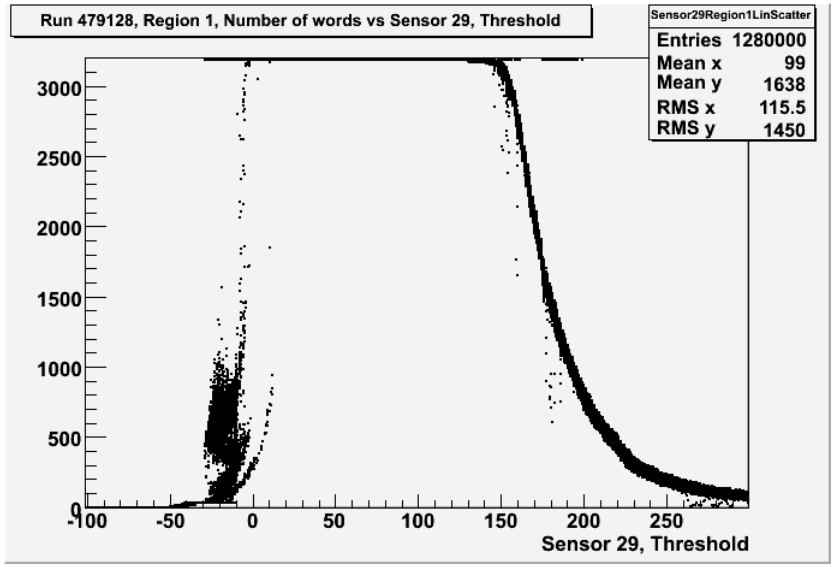


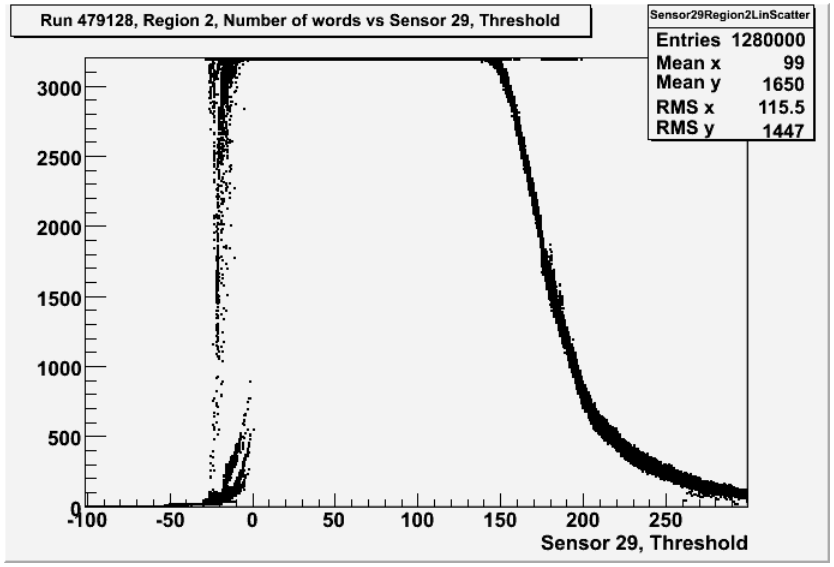
Unmasked runs for 8000BX/BT; scatter

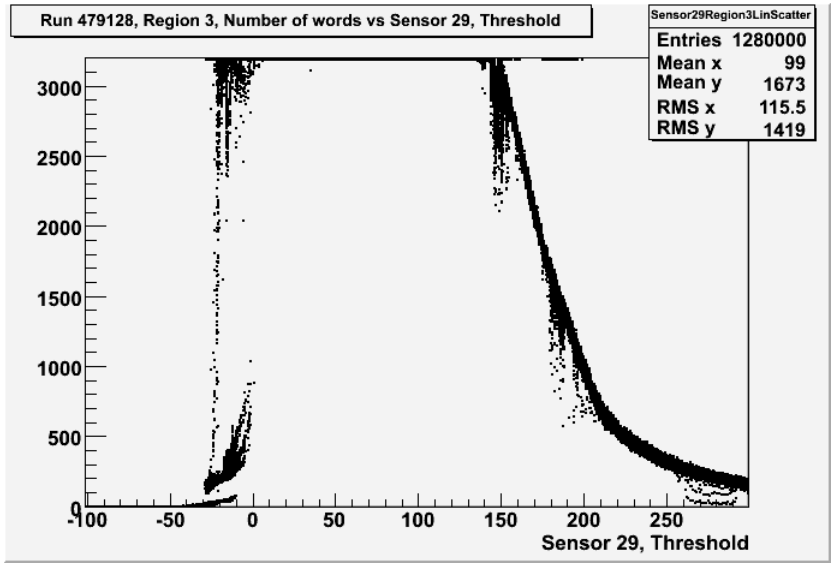


Four regions not exactly the same

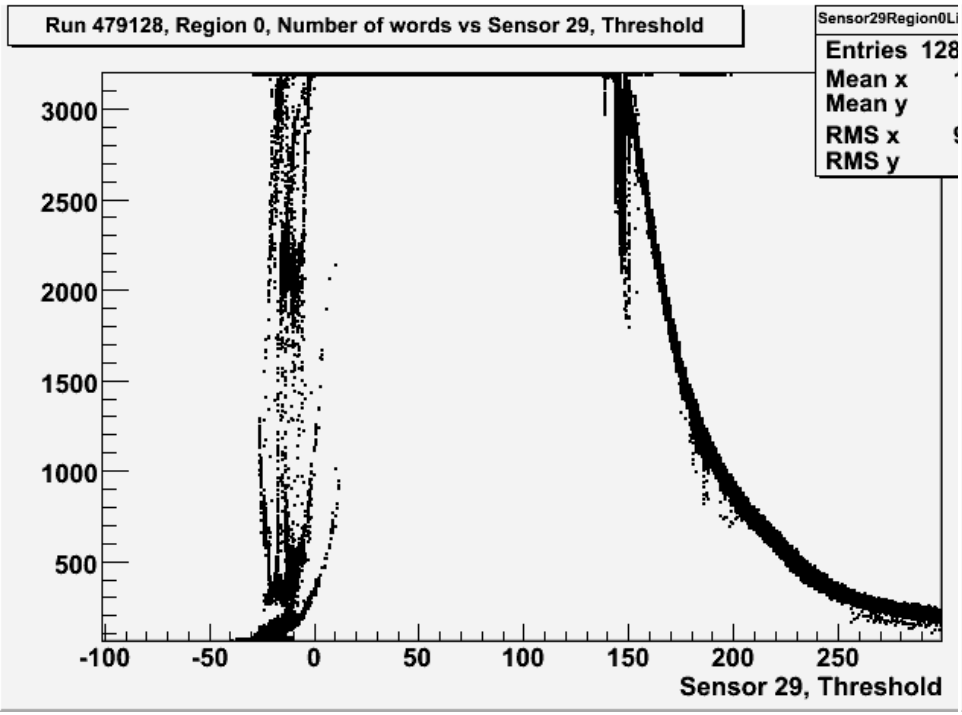




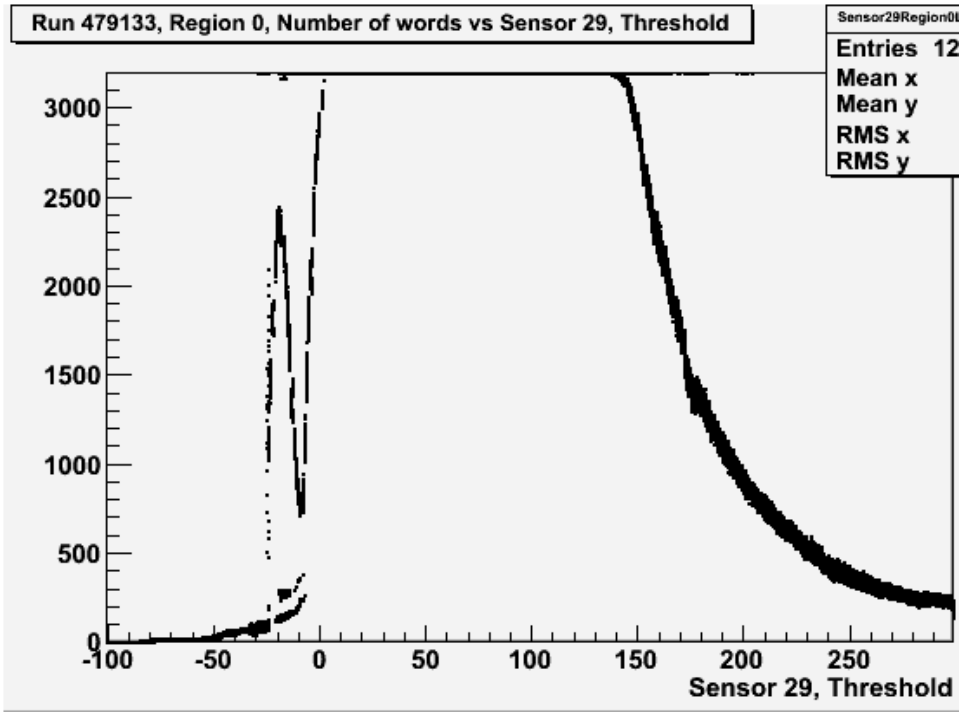




Not exactly reproducible

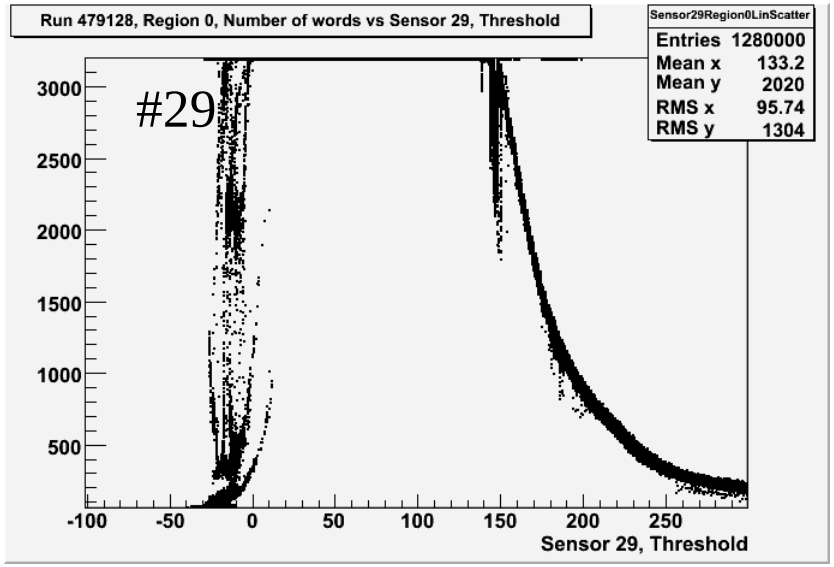


13/6/09



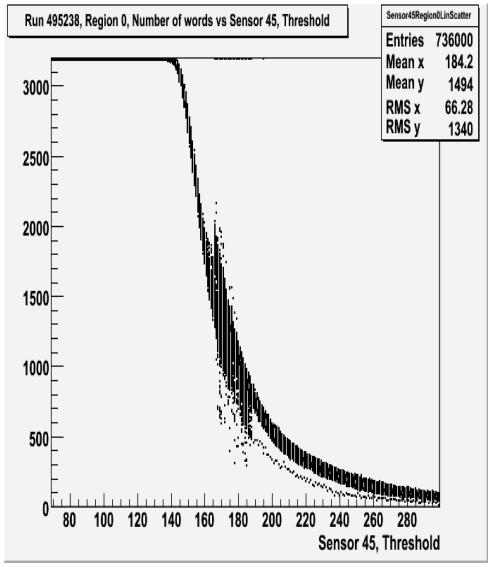
25/6/09

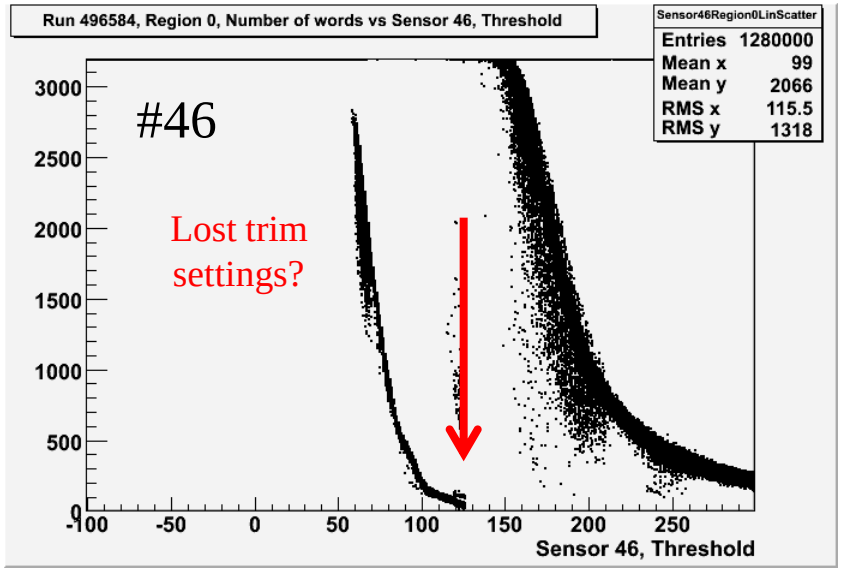
The four sensors vary significantly

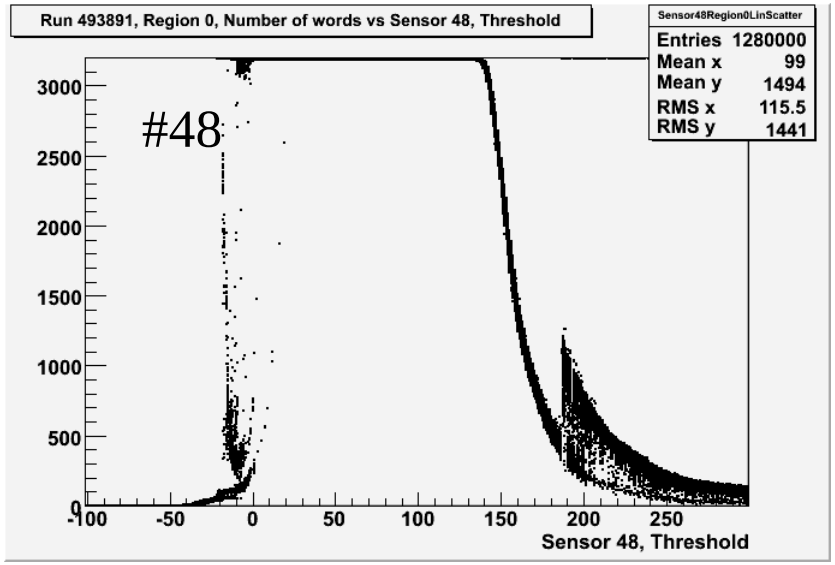


#45

Run stopped artifically







Conclusions

- For trimming, the sensors look very uniform
  - Same mean, noise distributions
  - Same response to trim
  - Very few dead pixels
- Will hit memory limit if running for 8000BX/BT
  - Only for a few of the most noisy pixels
  - Can reduce rate significantly by masking most noisy ~2% of pixels
- When running with all pixels unmasked, see instabilities
  - Not very reproducible for a given sensor
  - Different sensor to sensor