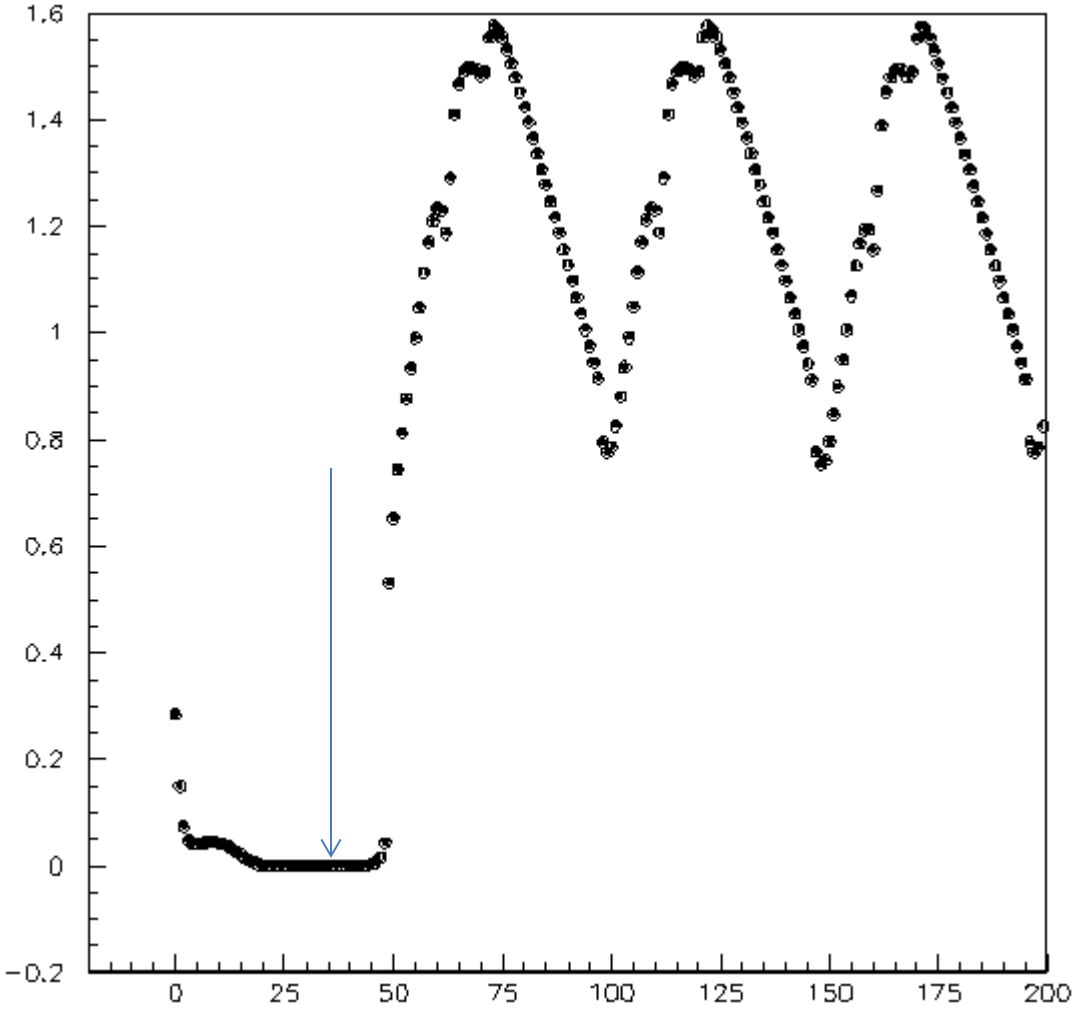
Kabir/Crawford Data Summary File

- Provides yield vs. $t\text{-}t_{drop}$ for each wire.
- Separate accounting for dropped pulses w/ RFSF on and RFSF off.
- No irregular dropped pulses.
- 5% of U/D data; no irregular dropped pulses

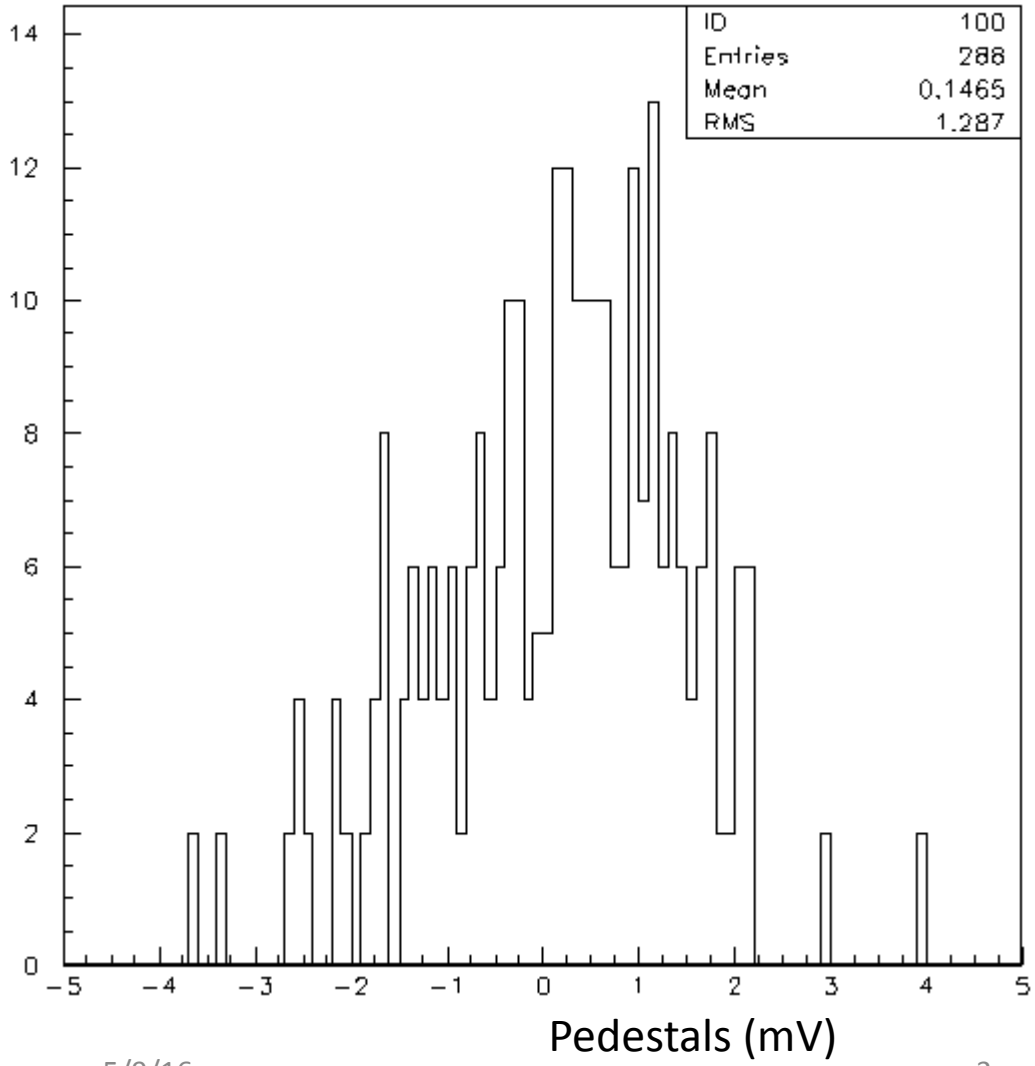
Pedestals

- Pedestal value for each wire: average yield in time bin 36 of dropped pulse



Pedestal Values

- One entry per wire for each of the two dropped pulse spin-flipper states.
- For scale, back/edge wires have signals of <10 mV.

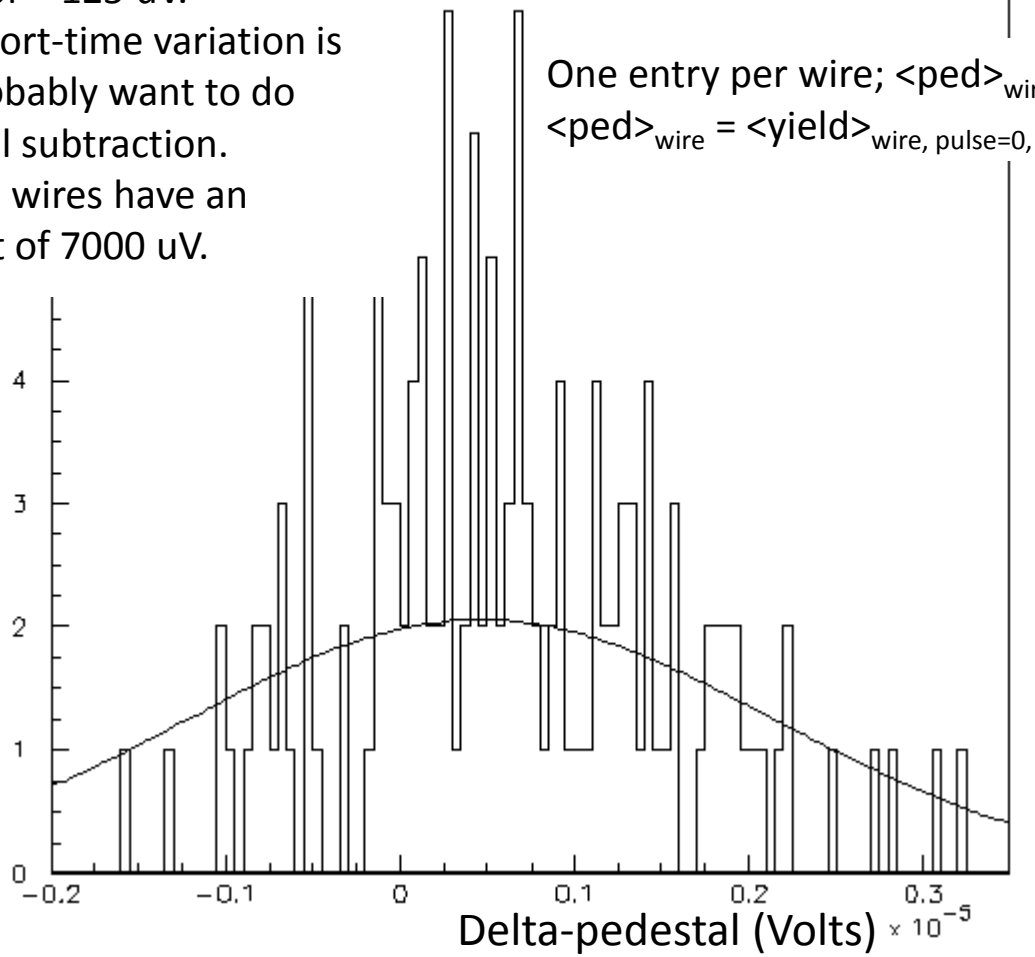


Pedestal Variation

- Gaussian width (1.4 uV) implies underlying pedestal variations of ~ 125 uV.
- Since (I think) the short-time variation is less than this we probably want to do "time-local" pedestal subtraction.
- For scale: back/edge wires have an average pulse height of 7000 uV.

One entry per wire; $\langle ped \rangle_{wire,\ dpsf=off} - \langle ped \rangle_{wire,\ dpsf=on}$

$\langle ped \rangle_{wire} = \langle yield \rangle_{wire,\ pulse=0,\ tof=36}$



Pedestal Message

- We do need to account for pedestals.
- The regular dropped pulses provide a convenient measure of the pedestal, but we need to look at the behavior vs. time to make sure that variations within the 600-pulse interval are sufficiently small to make it a good measure.

“Negative Image Pulse”

Average yield vs. time after a dropped pulse for each wire:

$$Y'_{\text{wire, pulse, tof}} = \frac{1}{2}\sum_{\text{spin}} \frac{\left(Y_{\text{spin, wire, pulse, tof}} - P_{\text{spin, wire}}\right)}{\text{NSEQ}_{\text{spin}}}$$

Expected average yield (perfect peak) vs. time after start of a pulse for each wire:

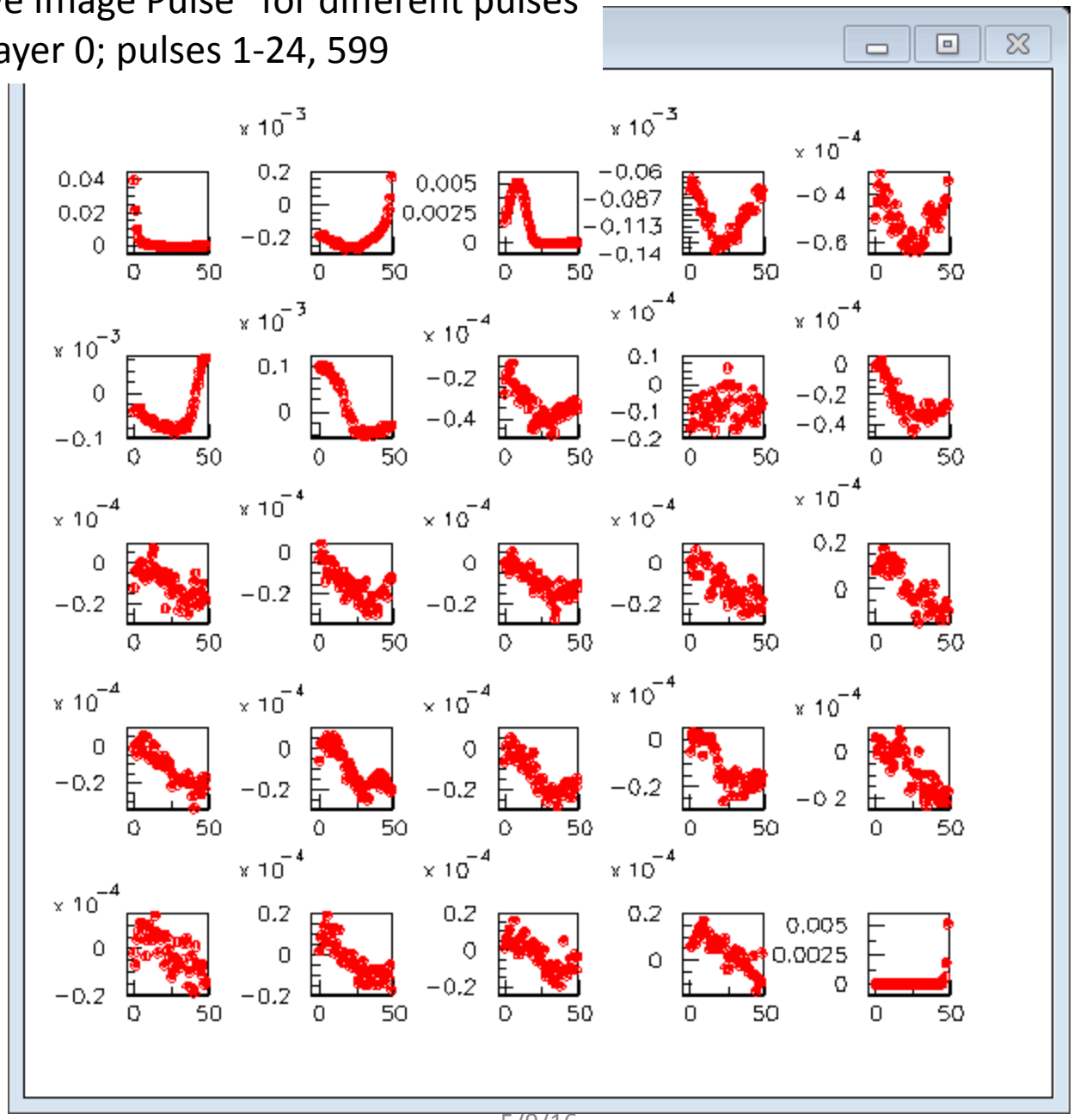
$$PP_{\text{wire, tof}} = \frac{1}{599}\sum_{\text{pulse}} Y'_{\text{wire, pulse, tof}}$$

Negative Image Pulse vs. time after start of a pulse for each wire:

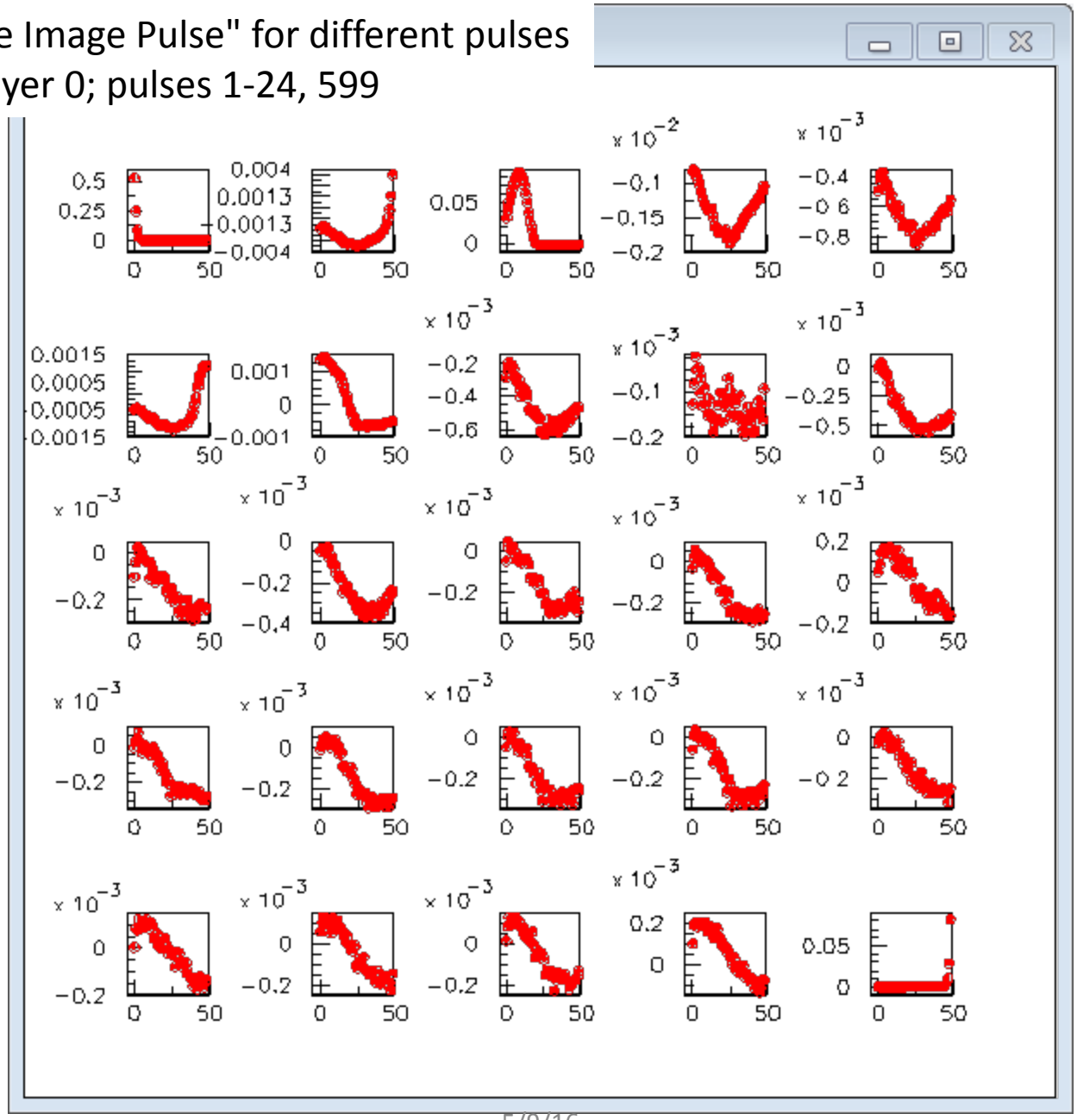
$$NIP_{\text{wire, pulse, tof}} = Y_{\text{wire, pulse, tof}} - PP_{\text{wire, tof}}$$

y-axes for all following plots are in volts

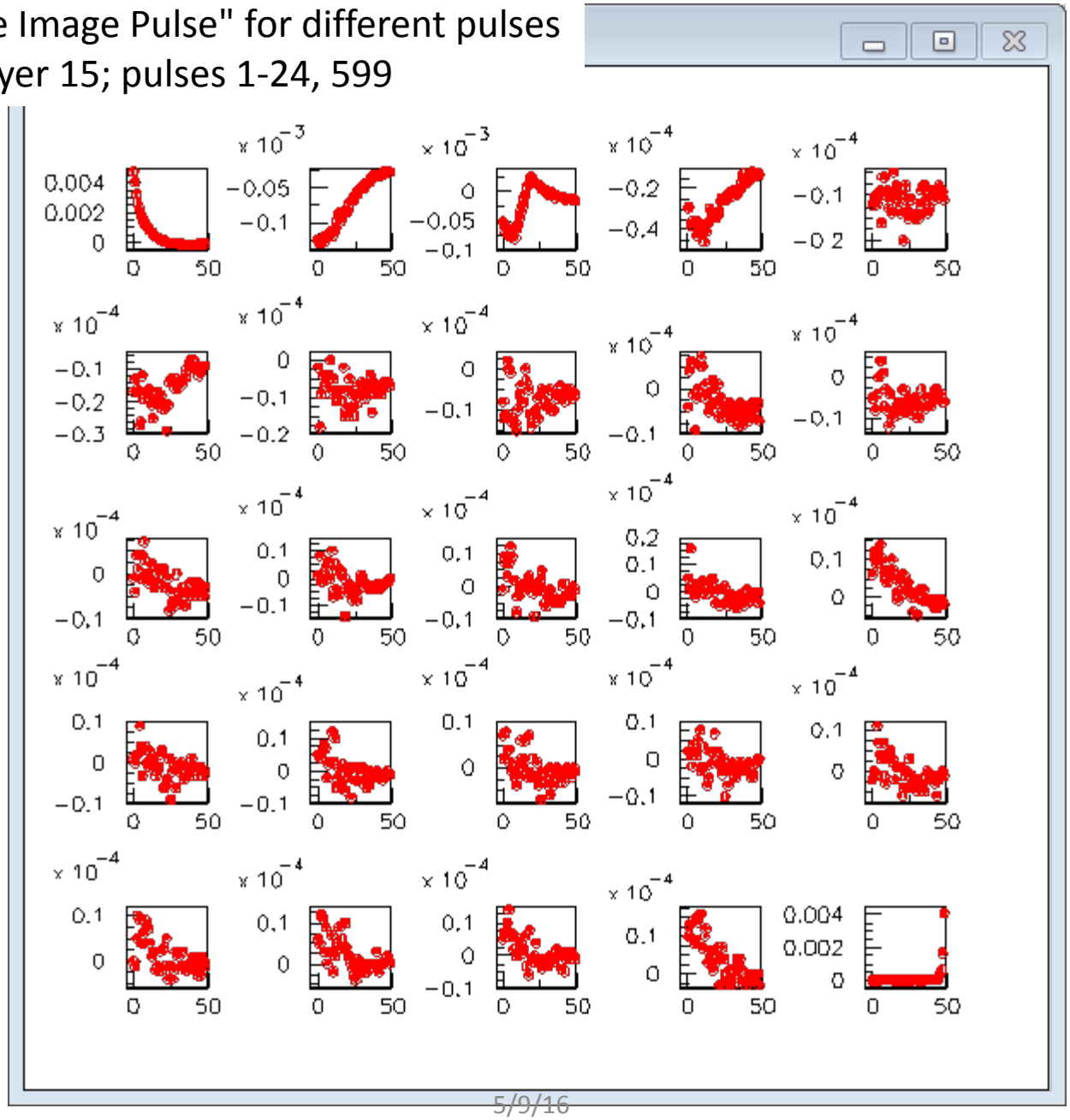
"Negative Image Pulse" for different pulses
wire 0, layer 0; pulses 1-24, 599

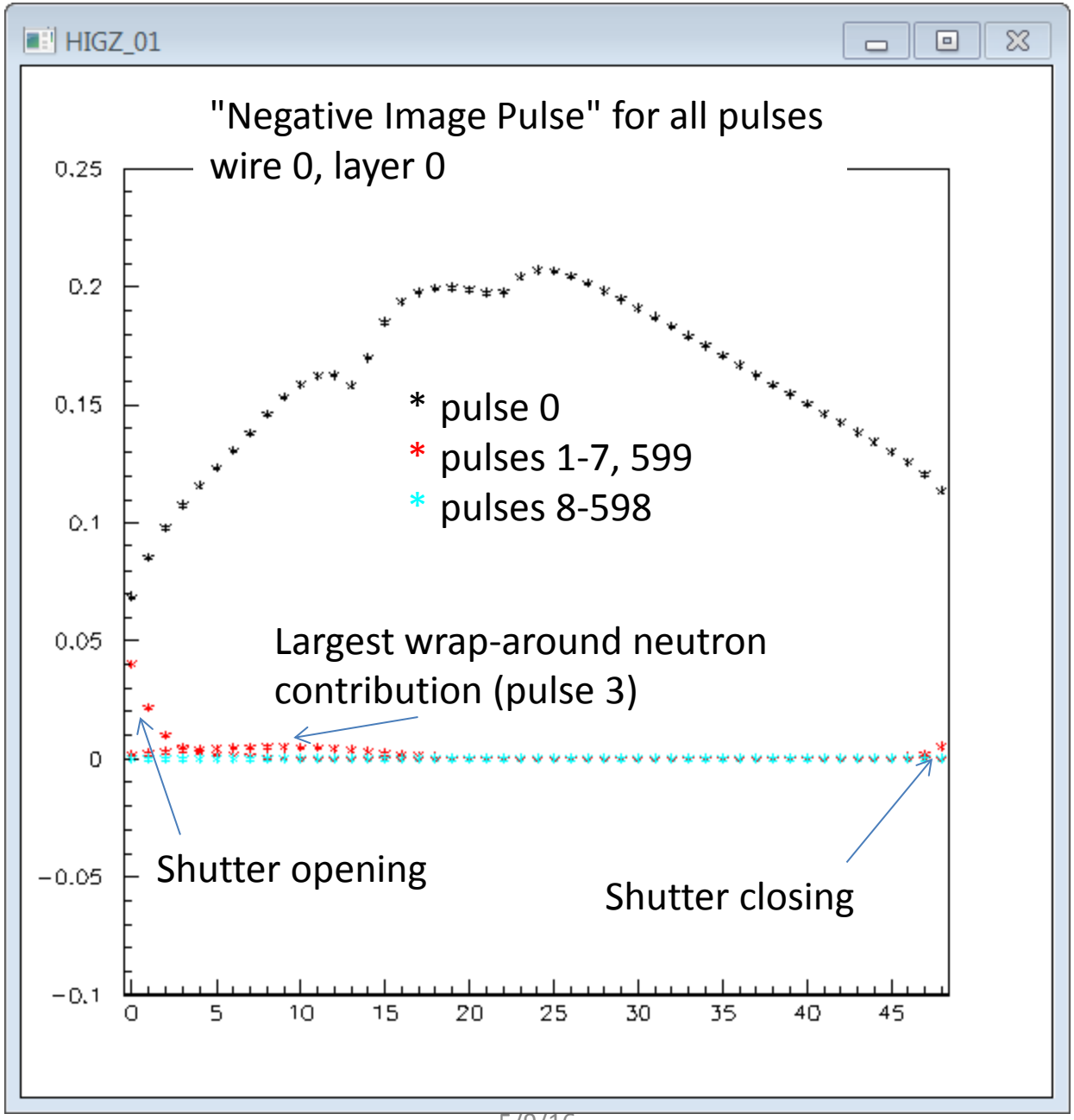


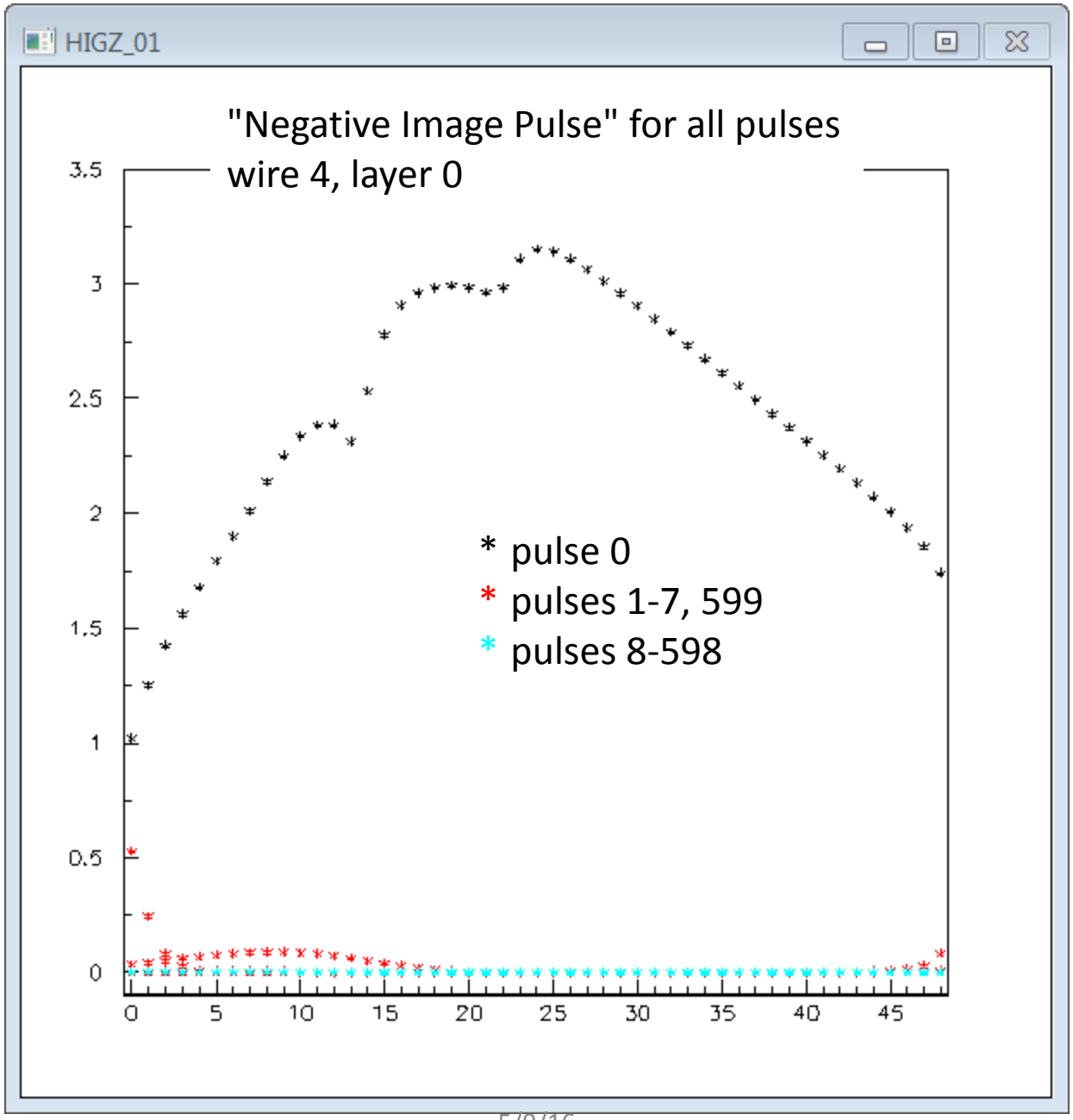
"Negative Image Pulse" for different pulses
wire 4, layer 0; pulses 1-24, 599

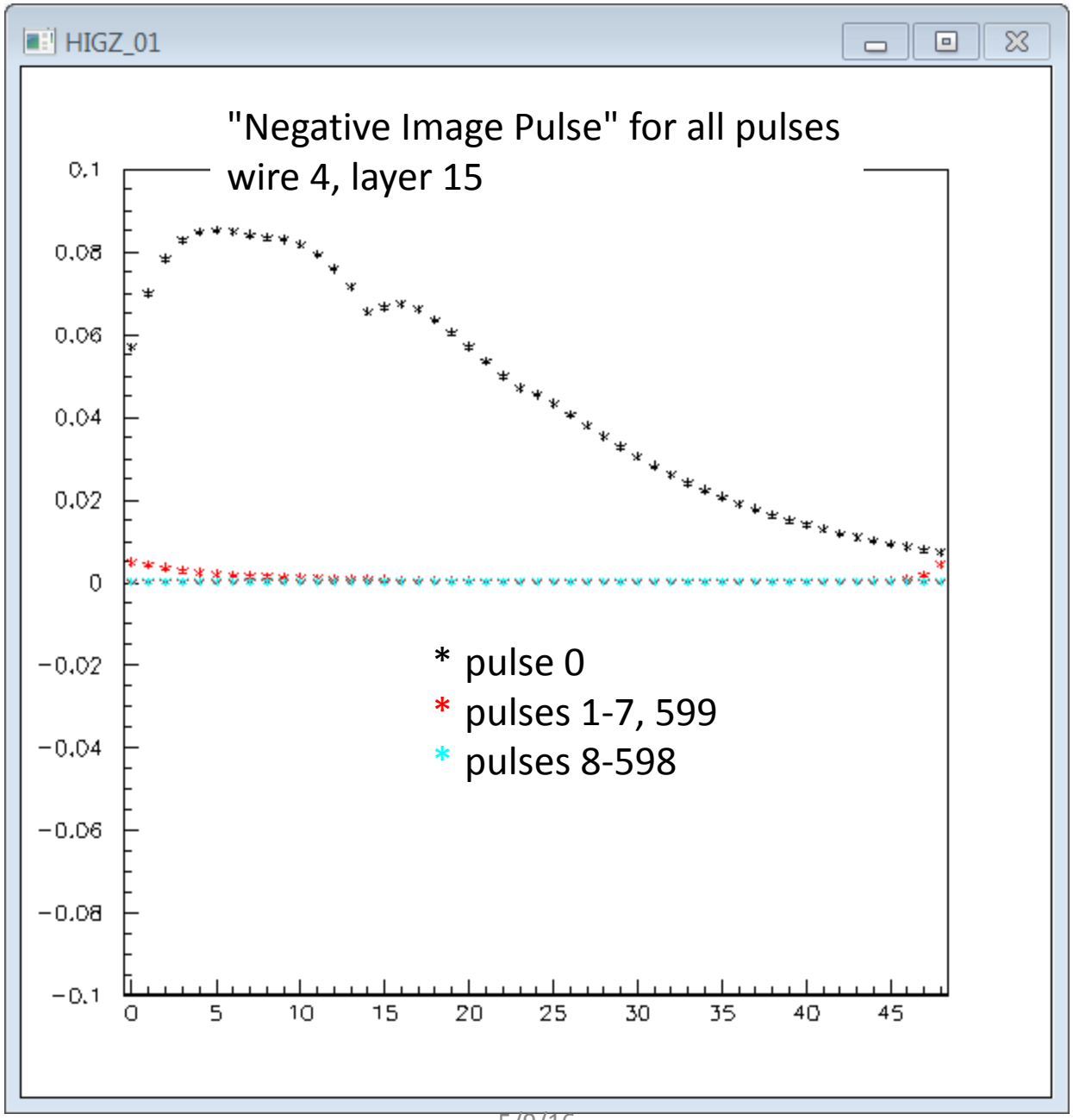


"Negative Image Pulse" for different pulses
wire 4, layer 15; pulses 1-24, 599

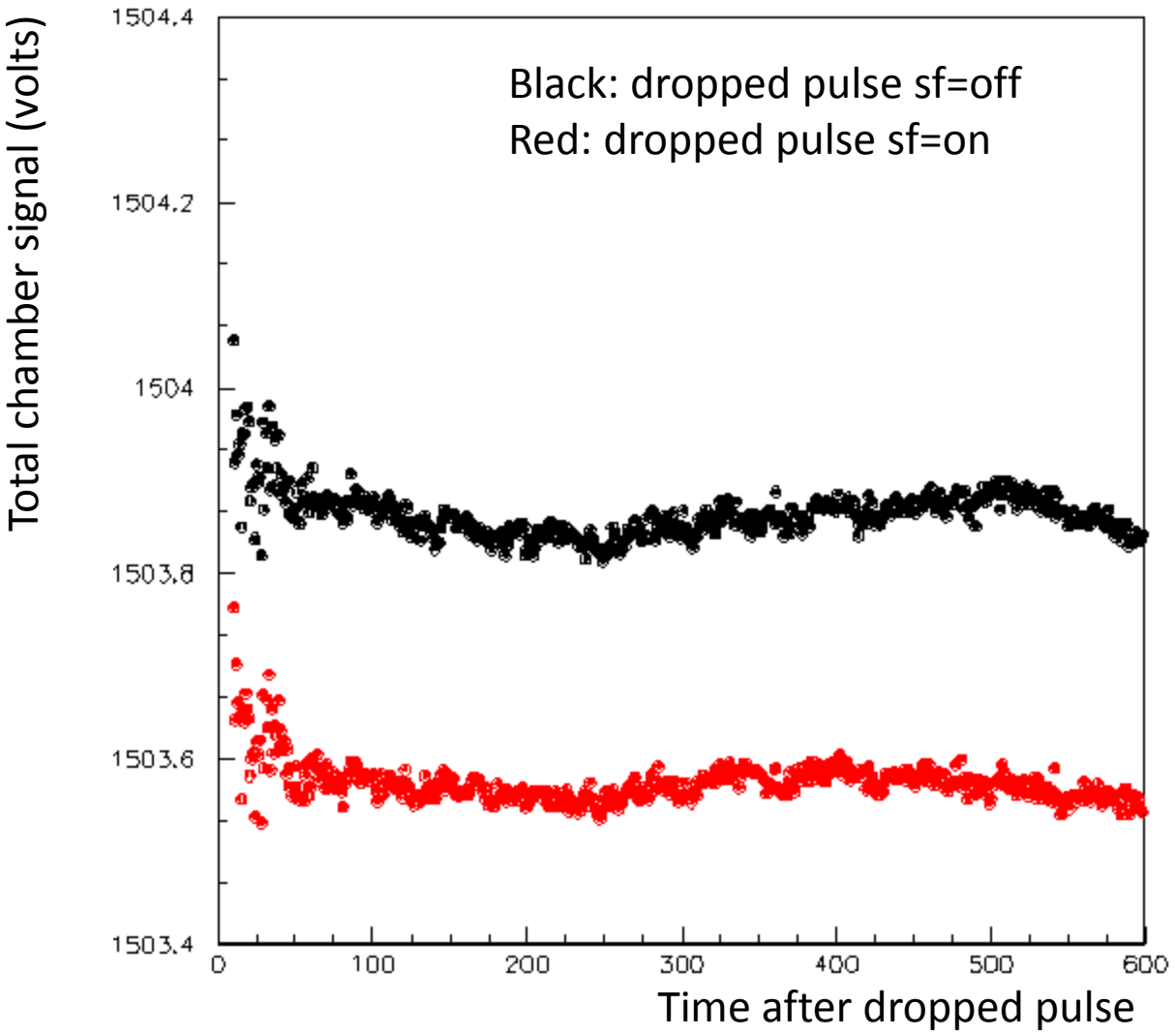


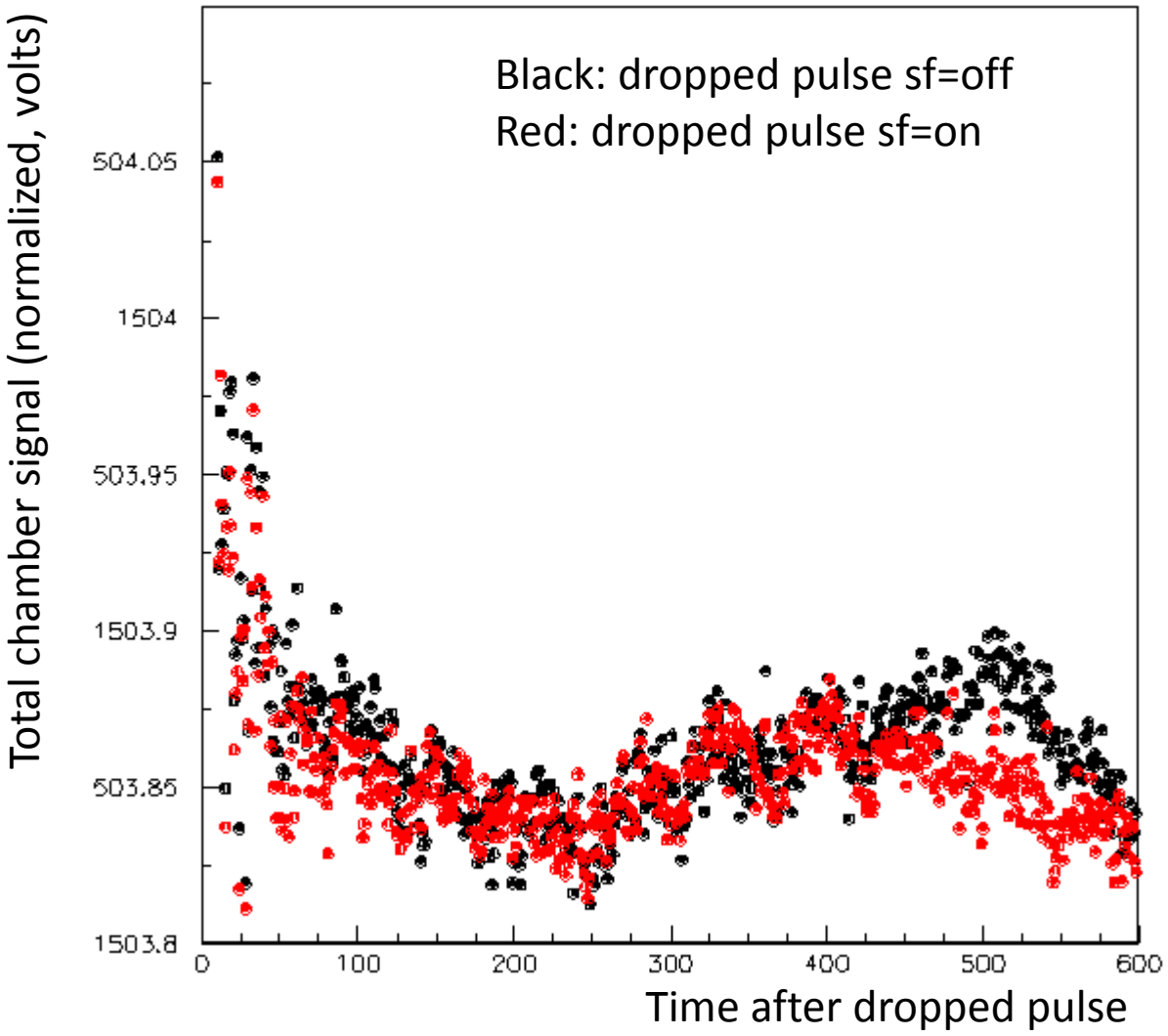

HIGZ_01
"Negative Image Pulse" for all pulses
wire 0, layer 0
0.25
0.2
0.15
0.1
0.05
0
−0.05
−0.1
0
5
10
15
20
25
30
35
40
45
* pulse 0
* pulses 1-7, 599
* pulses 8-598
Largest wrap-around neutron
contribution (pulse 3)
Shutter opening
Shutter closing

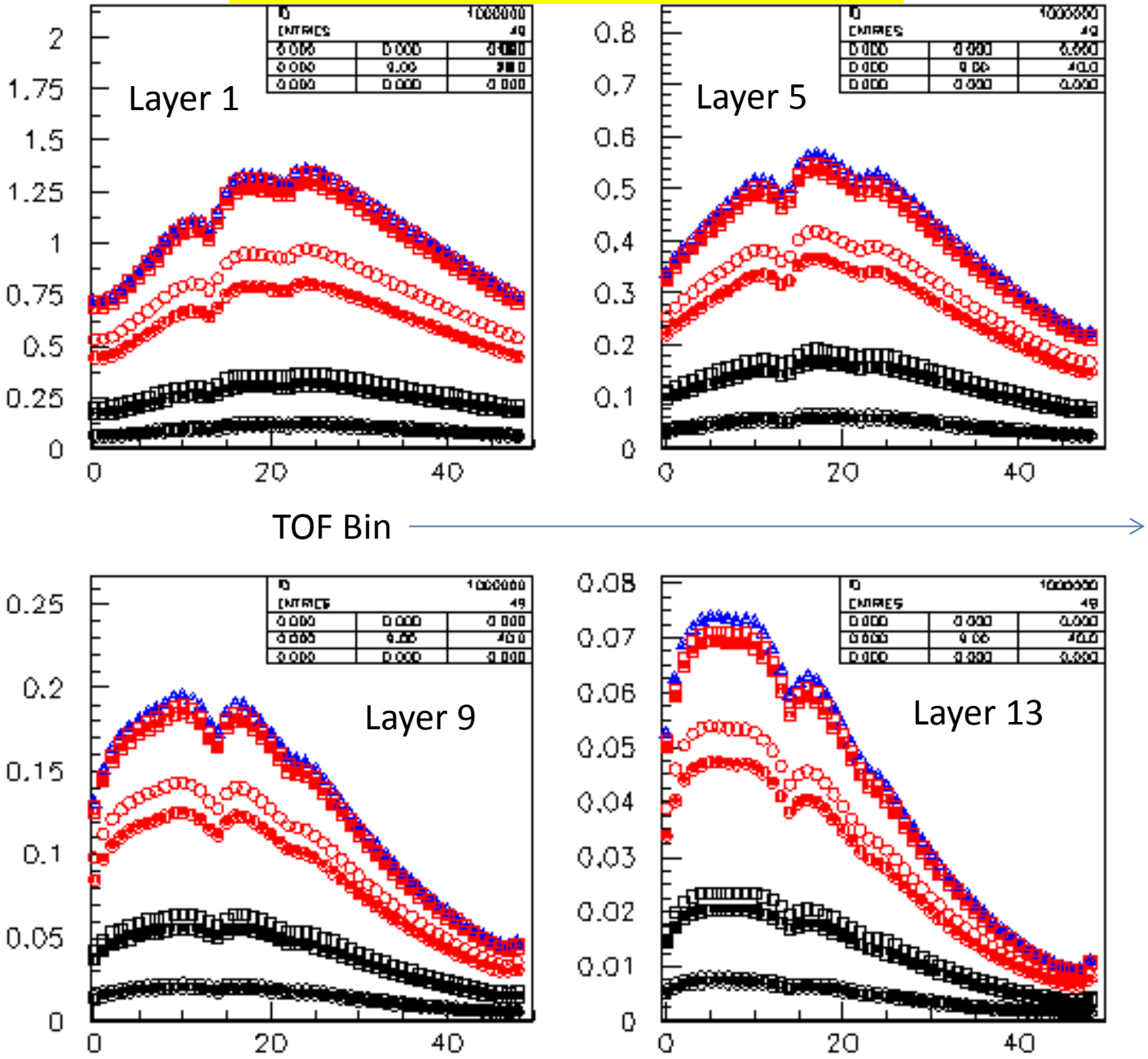

HIGZ_01
"Negative Image Pulse" for all pulses
wire 4, layer 0
* pulse 0
* pulses 1-7, 599
* pulses 8-598
3.5
3
2.5
2
1.5
1
0.5
0
0
5
10
15
20
25
30
35
40
45


HIGZ_01
"Negative Image Pulse" for all pulses
wire 4, layer 15
0.1
0.08
0.06
0.04
0.02
0
−0.02
−0.04
−0.06
−0.08
−0.1
0
5
10
15
20
25
30
35
40
45
* pulse 0
* pulses 1-7, 599
* pulses 8-598

- A couple of things I noticed, just in case they are interesting…
- Average total chamber signal vs. time after a dropped pulse does vary at least a bit…
- Beam not quite centered? Or response unequal left/right?


Black: dropped pulse sf=off
Red: dropped pulse sf=on
Total chamber signal (volts)
1504.4
1504.2
1504
1503.8
1503.6
1503.4
0
100
200
300
400
500
600
Time after dropped pulse


Black: dropped pulse sf=off
Red: dropped pulse sf=on
Total chamber signal (normalized, volts)
504.05
1504
503.95
1503.9
503.85
1503.8
0
100
200
300
400
500
600
Time after dropped pulse

Open symbols are wires 5-8 (beam left?)

Wire Yield (Volts)