

Perfect Pulse Analysis from full UD data set

## Algorithm for constructing perfect pulse to extract pedestal :

- **Construct average pulse :** Using Amplified 600 sequence (from DST) , take sum over all 600 pulses in that sequence. However divide the sum by 599 to get the average single pulse signal.
- **Construct the image (surrogate) pulse:** From each of the original 600 pulses subtract the average pulse signal. (Actually I did the opposite here i.e.  $I_{ave} - I_i$  to get positive values)
- **Construct perfect pulse :** Wrap the image pulse (all 600 windows ) to get the perfect pulse with pedestal already removed.
- **Fit perfect pulse to real data :**

Fit each pulse from real data to the constructed perfect pulse according to :

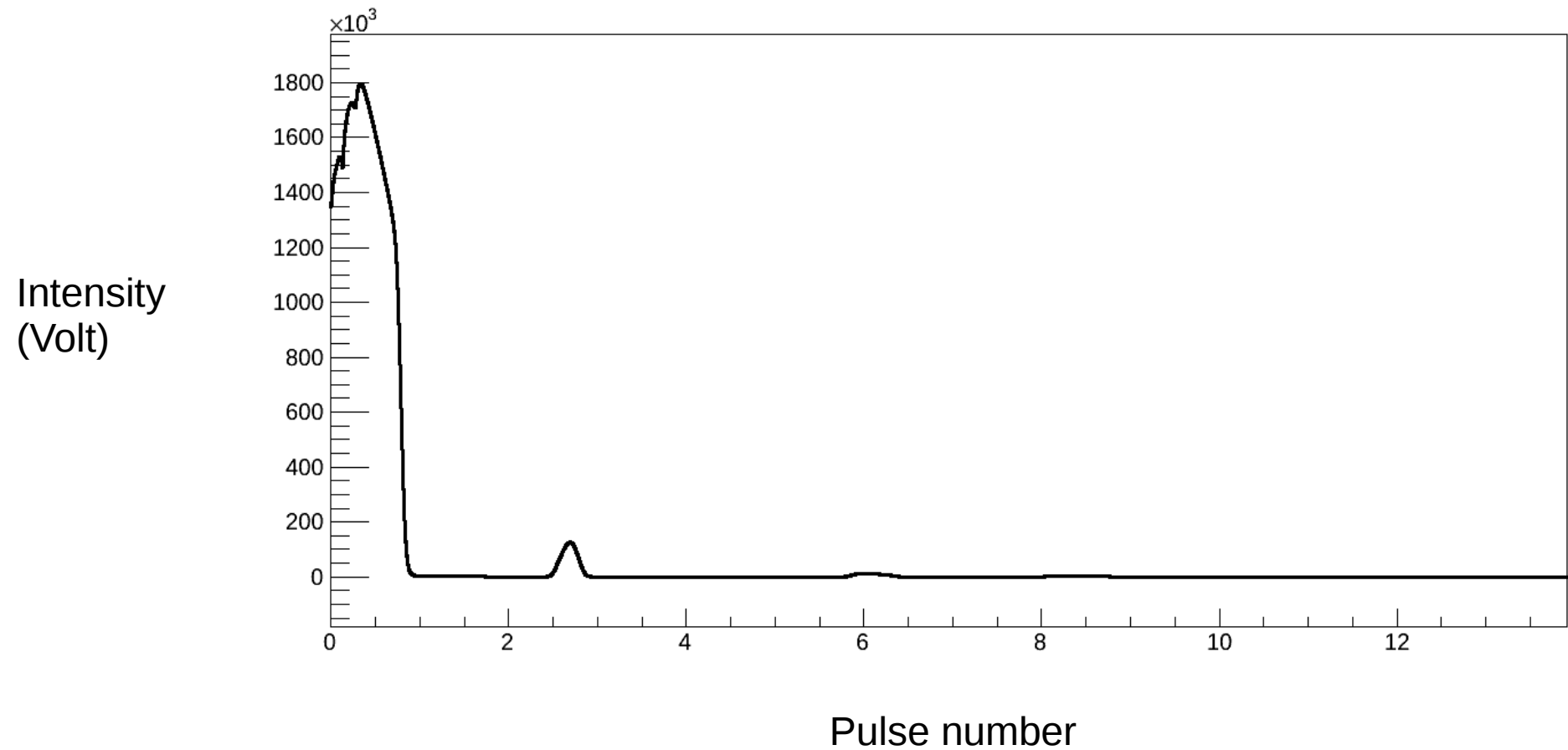
$$Y(\text{tof}) = a P(\text{tof}) + b$$

Where  $Y(\text{tof})$  is the signal from real data and  $P(\text{tof})$  is the signal from perfect pulse.

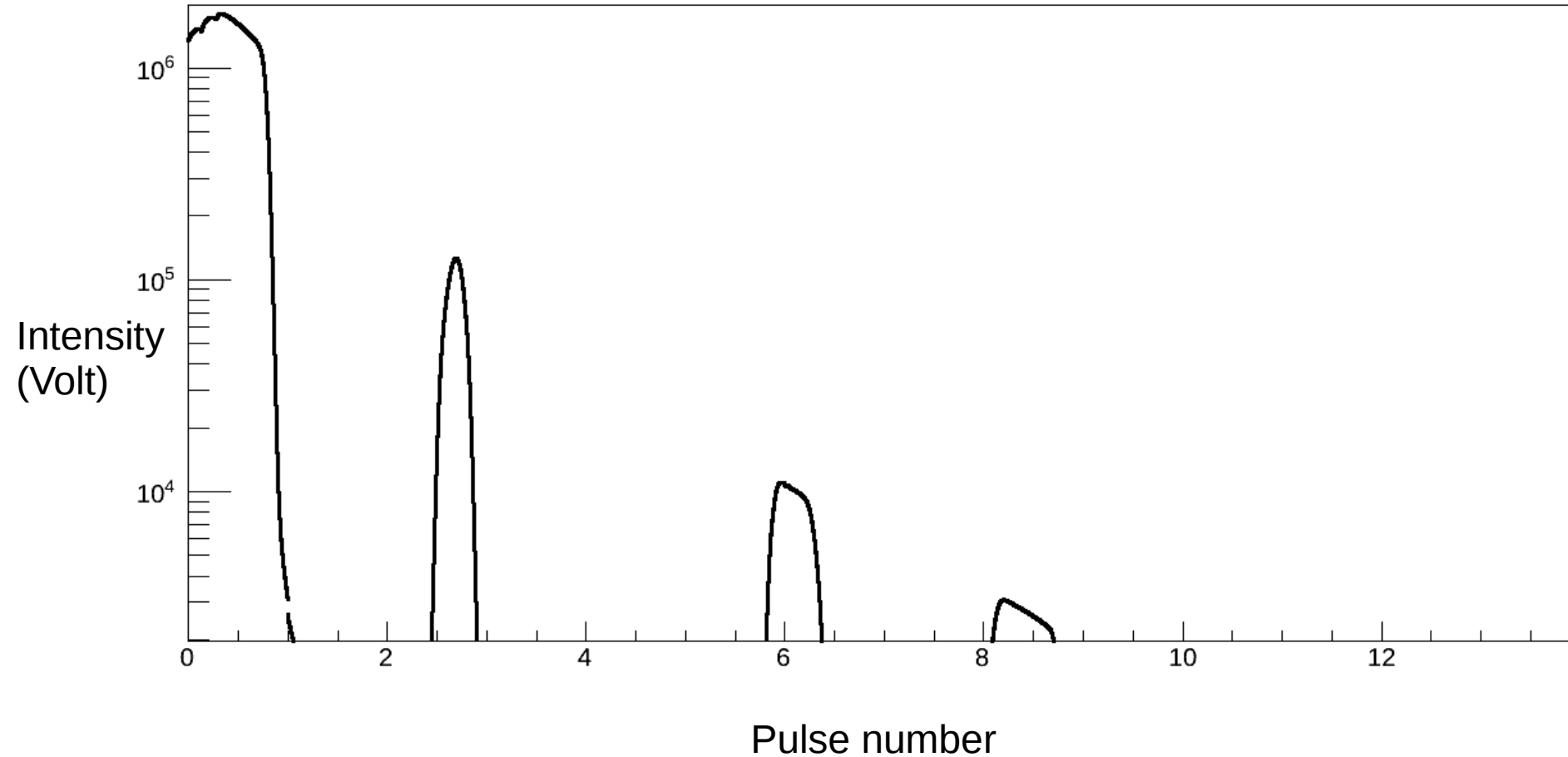
From the fit  $a$  and  $b$  will give variation in beam intensity and pedestal respectively.

- This time I am using full UD data set.

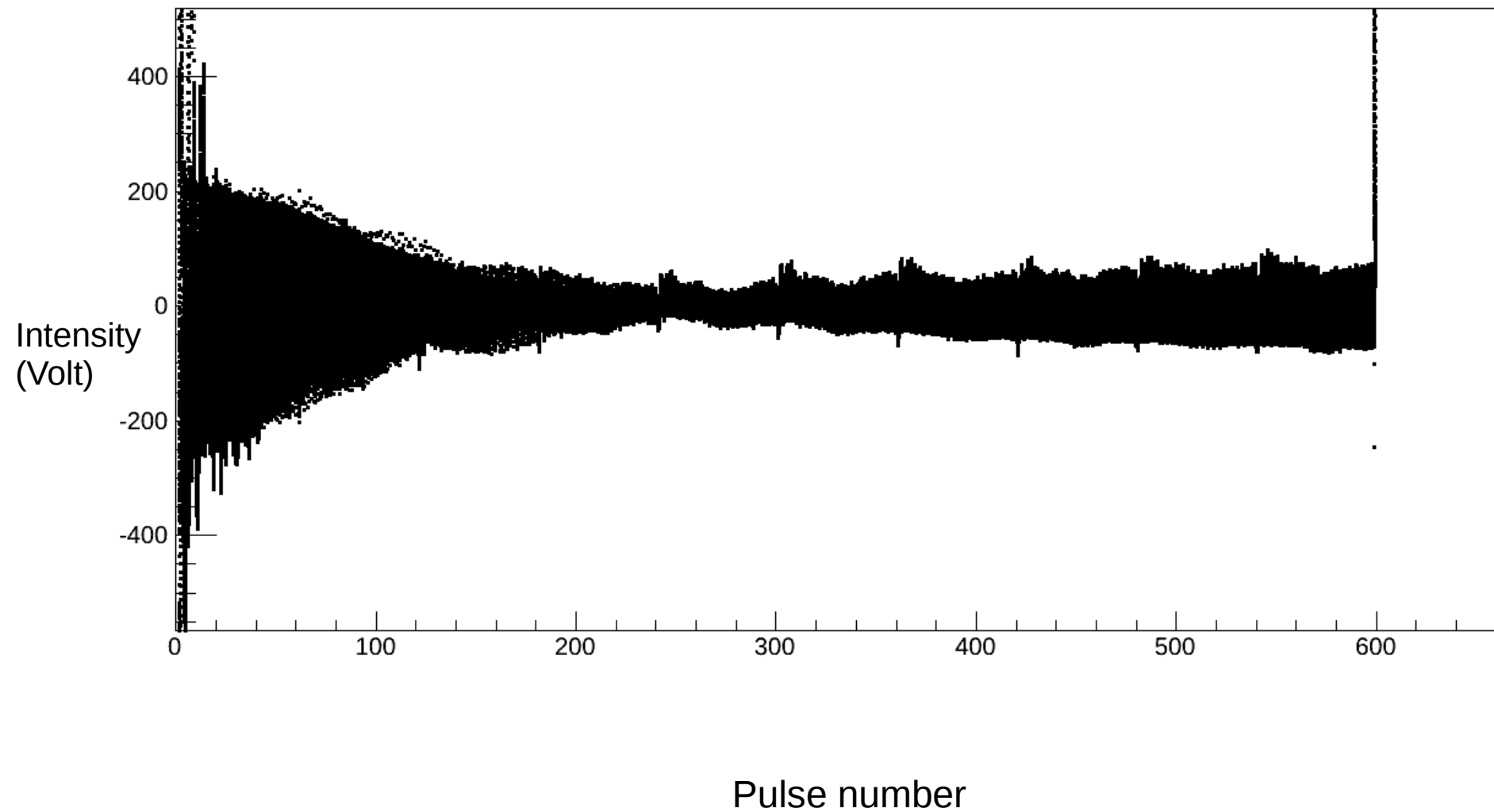
# Image(surrogate) pulse constructed from $(I_{ave} - I_i)$ – Zoom 1



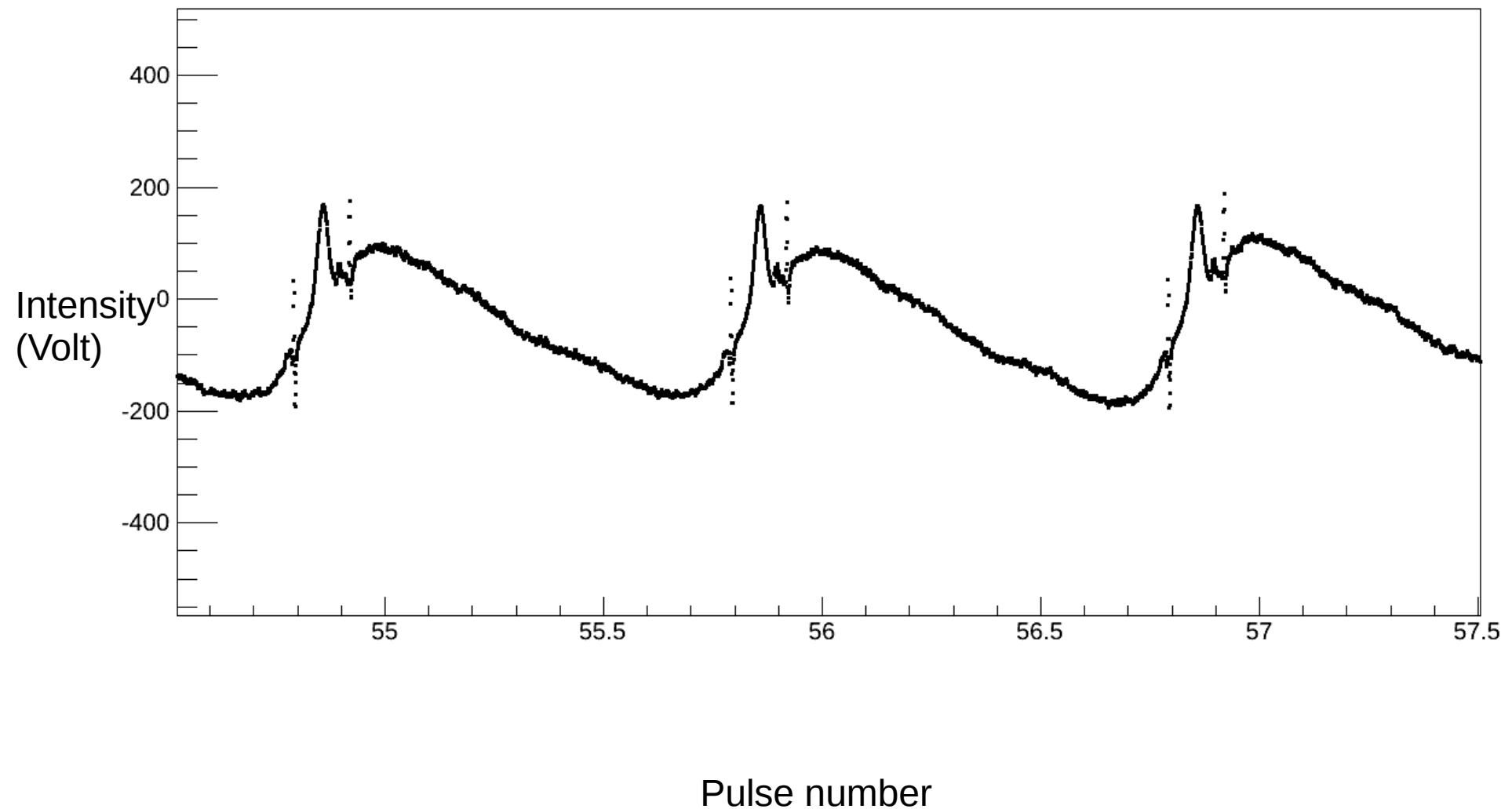
Image(surrogate) pulse constructed from  $(I_{ave} - I_i)$   
Zoom 2 (log scale)



# Image(surrogate) pulse constructed from $(I_{ave} - I_i)$ —Zoom 3

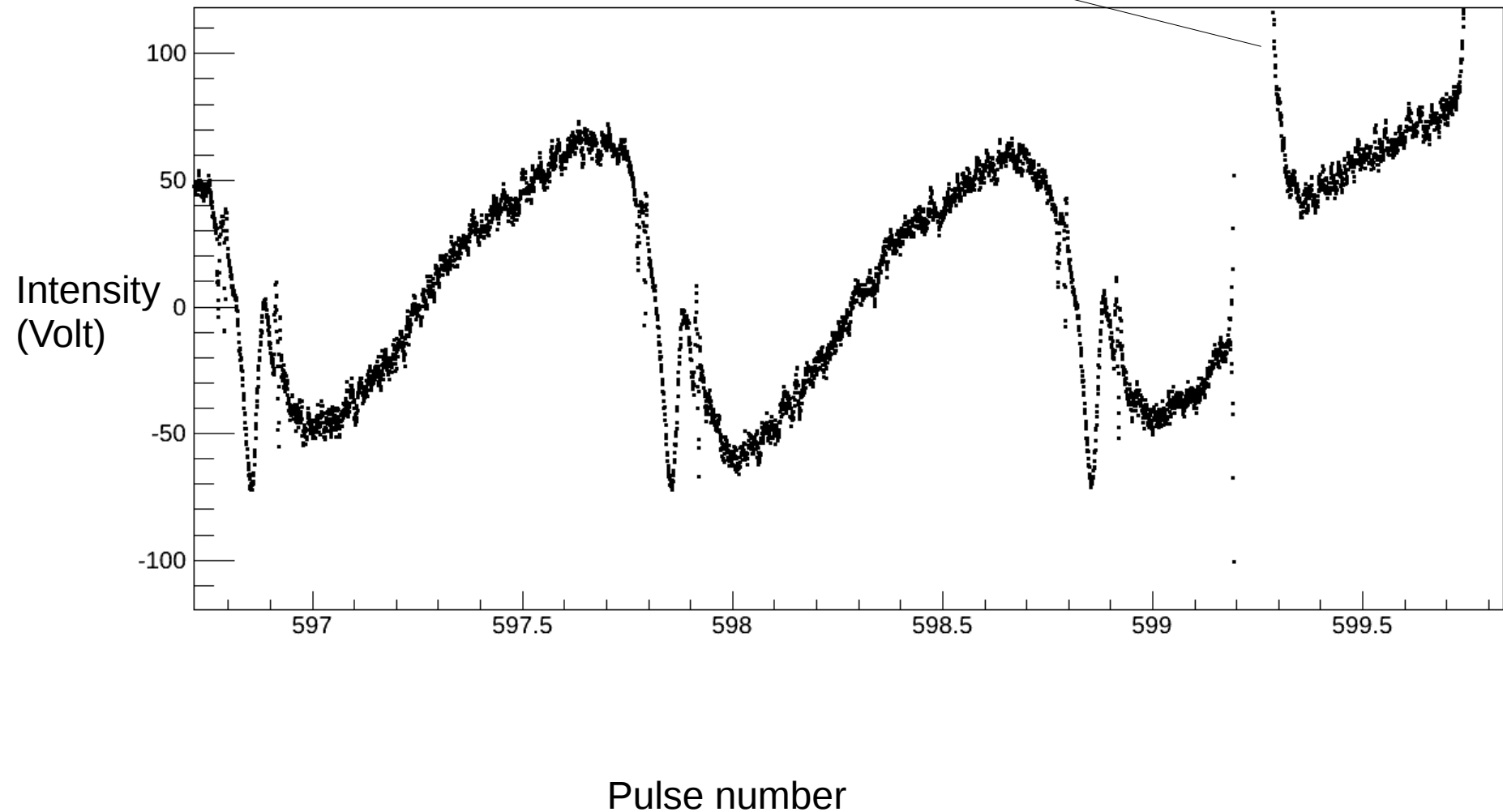


# Image(surrogate) pulse constructed from $(I_{ave} - I_i)$ —Zoom 4

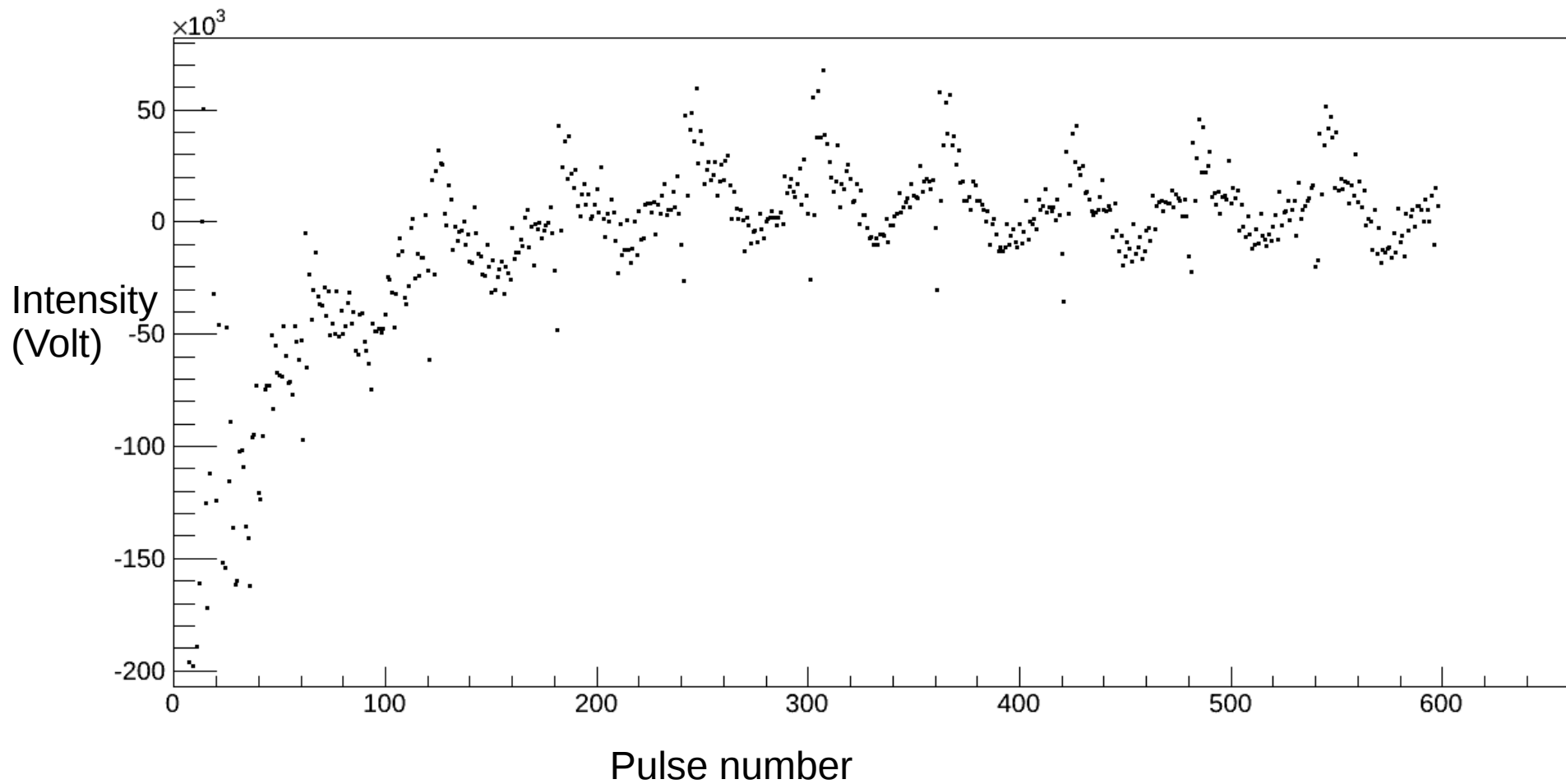


# Image(surrogate) pulse constructed from $(I_{ave} - I_i)$ –Zoom 5

Injection Flash

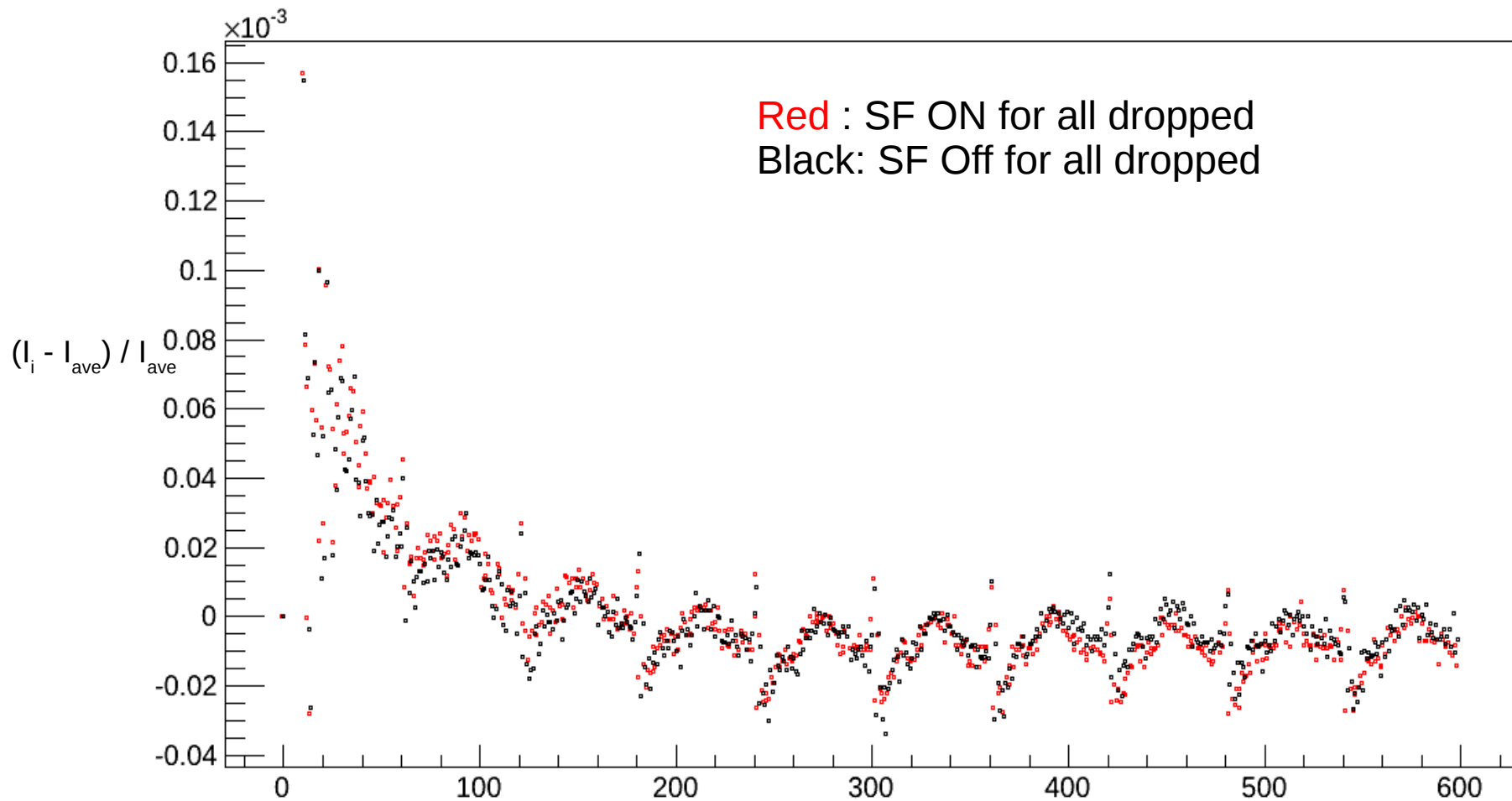


## Image(Surrogate) Pulse Intensity integrated over each pulse

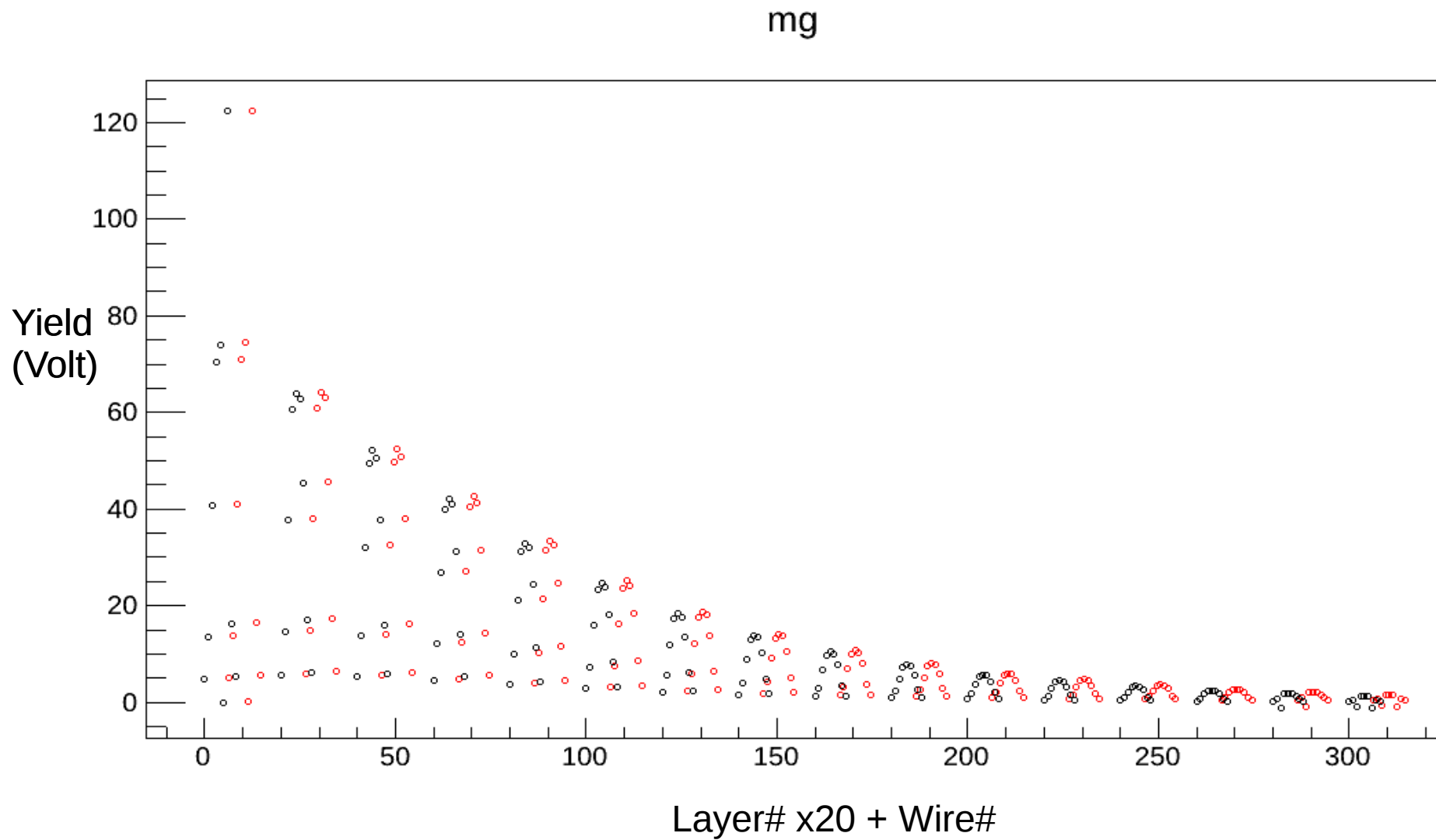




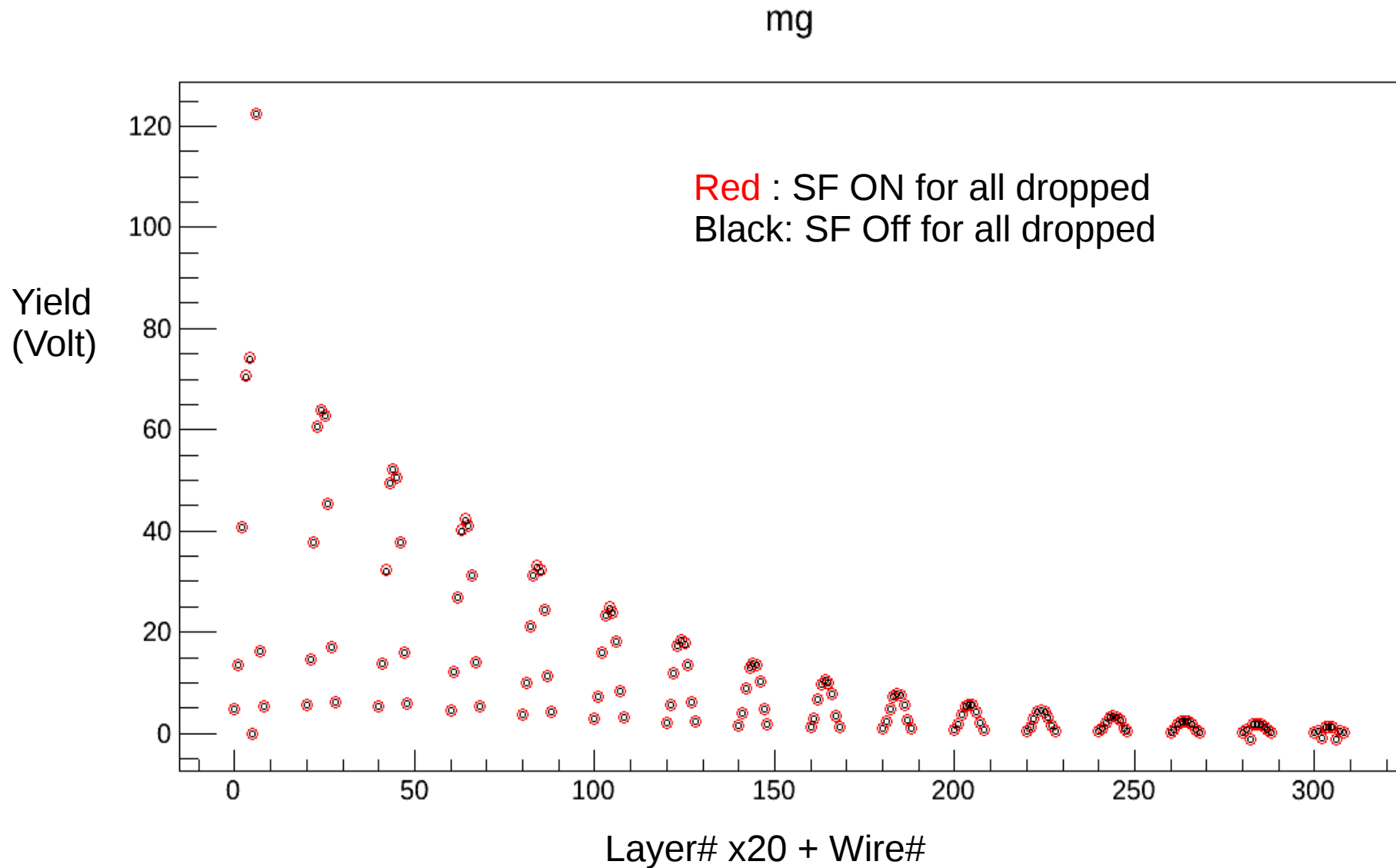
# Beam Variation[ $(I_i - I_{ave}) / I_{ave}$ Vs Pulse Number ]



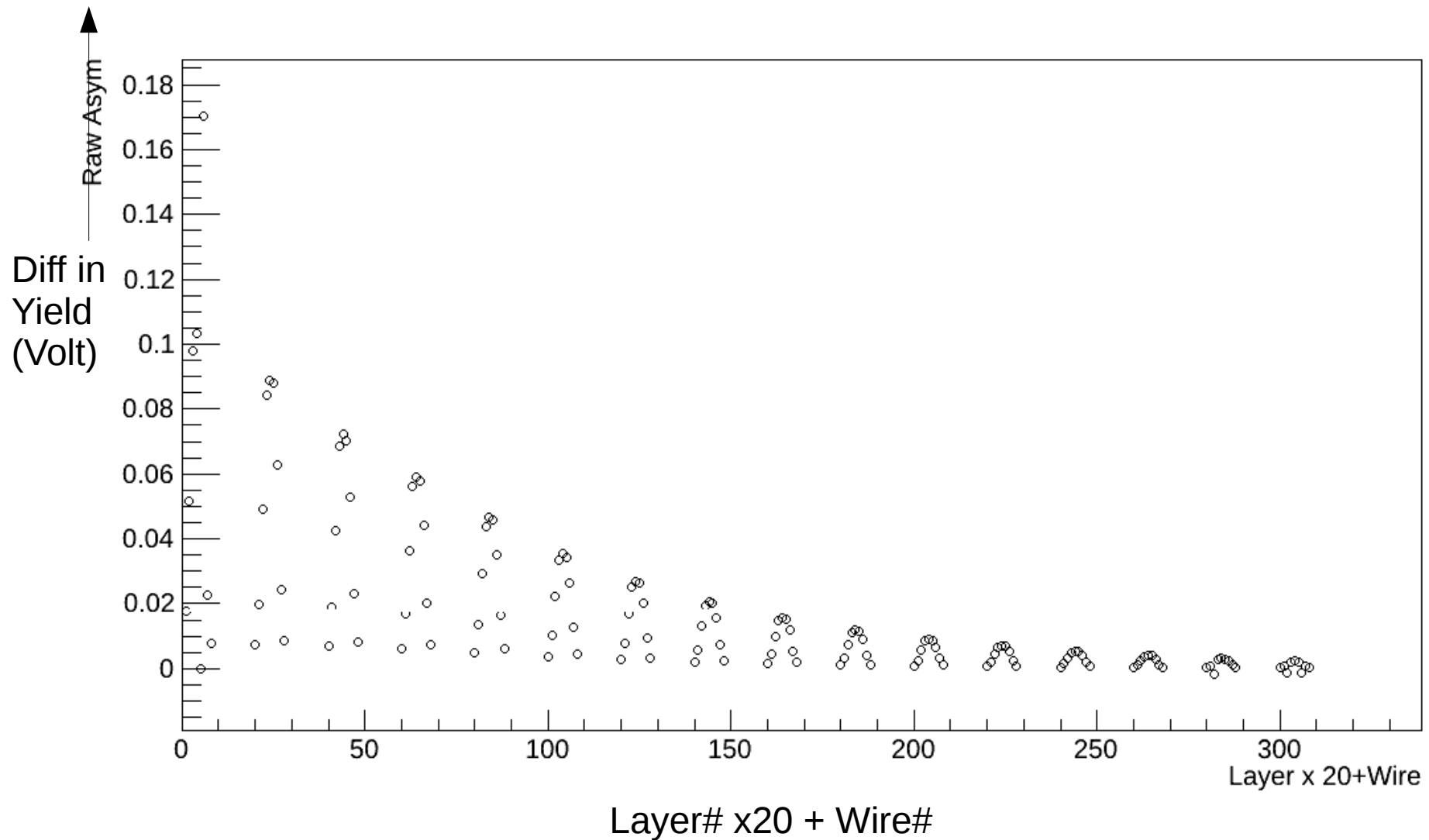
# Detector Yields (dropped pulses with SF On vs Off)



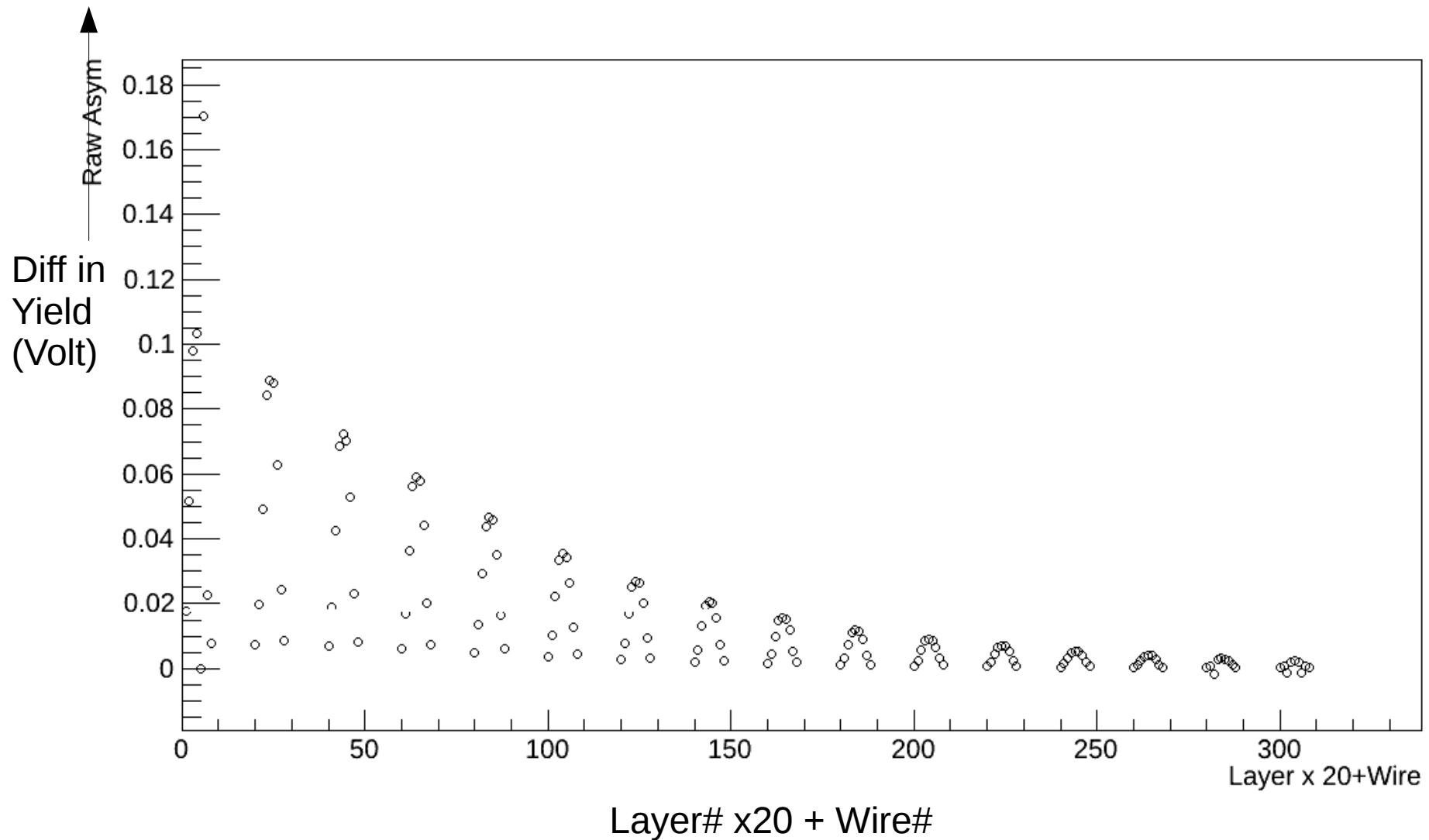
# Detector Yields (dropped pulses with SF On vs Off)



# Diff in Detector Yields (dropped pulses with SF On vs Off)



# Diff in Detector Yields (dropped pulses with SF On vs Off)



## Diff in Detector Yields (dropped pulses with SF On vs Off)

