py for physics assignment 1

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June 2022

Q3

For plotting the pulse without noise correction I used matplotlib.pyplot.plot(timespan,pulse values). The timespan was created using the information in the assignment by multiplying the time between measurements (5 nanoseconds) with the total amount of measurements (56).

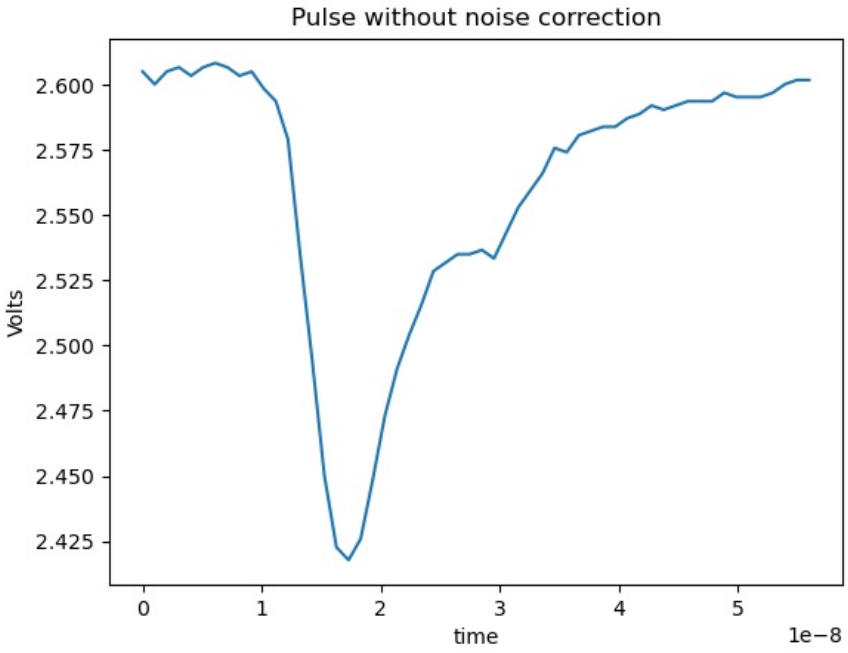

Figure 1:

Q5

To create the noise correction plot the script asks for how many values to use when calculating the mean, then subtracts this mean from each reading. The same timespan is used as in the previous plot. The figure below was created using 10 values for the noise correction term.

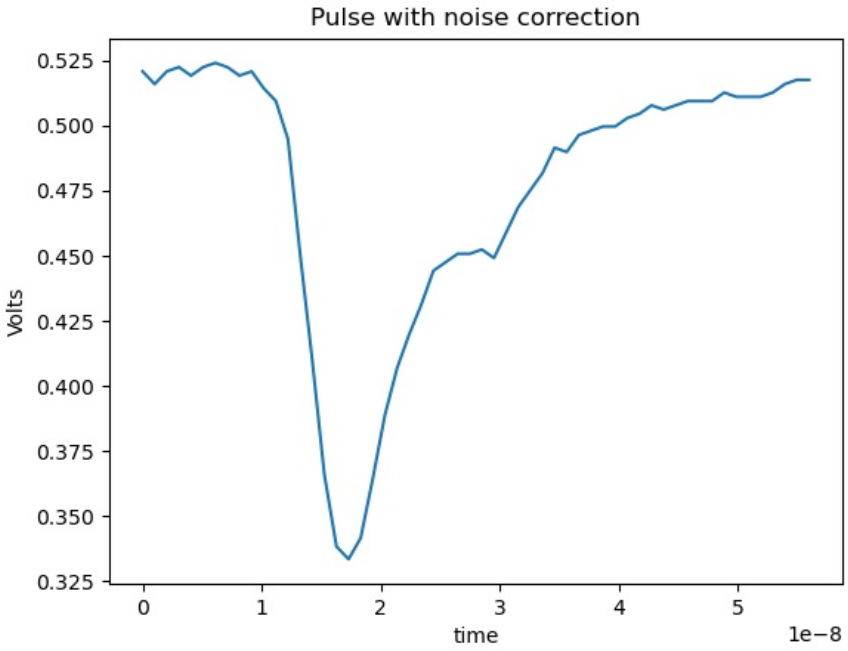

Figure 2: Noise corrected pulse plot

Q6

This histogram was created by summing all (noise corrected) values for a pulse. We see that it is heavily centered between 0 and 50, with the negative outliers likely being due to measurement errors.

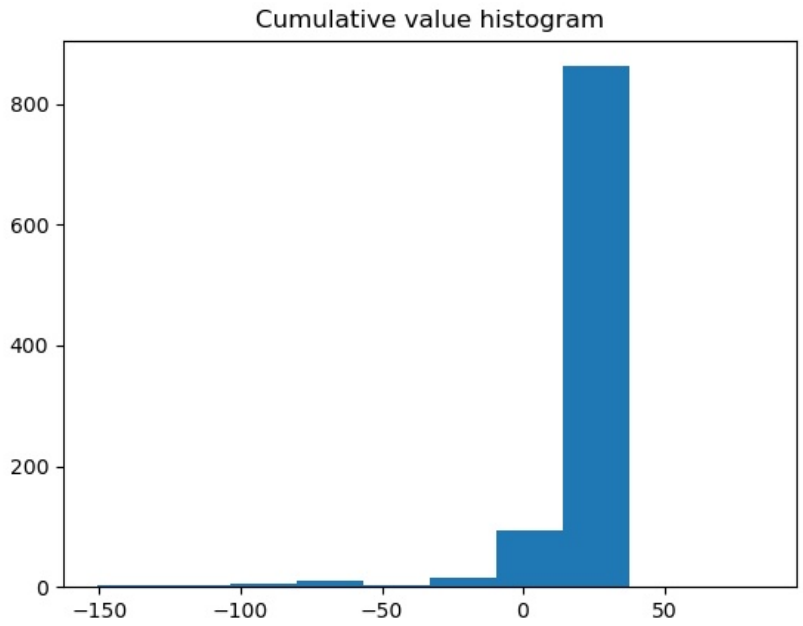

Figure 3: Cumulative sum for all pulses

This histogram was created by collecting the minimum value for all pulses. We see that the shape of it clearly resembles the previous histogram. This is logical, as if the minimum value of a pulse is negative then likely the noise correction term was "too big", which would result in the cumulative sum of all measurements for that (noise corrected) pulse also being negative.

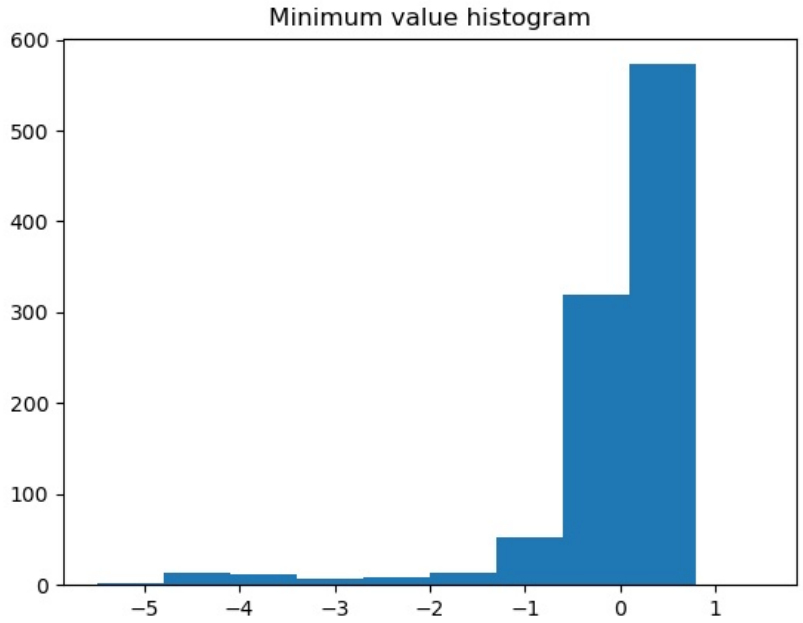

Figure 4: Minimum value histogram for all pulses

This is the histogram for the maximum value for all pulses. Since there is no spread it isn't indicative of any trends.

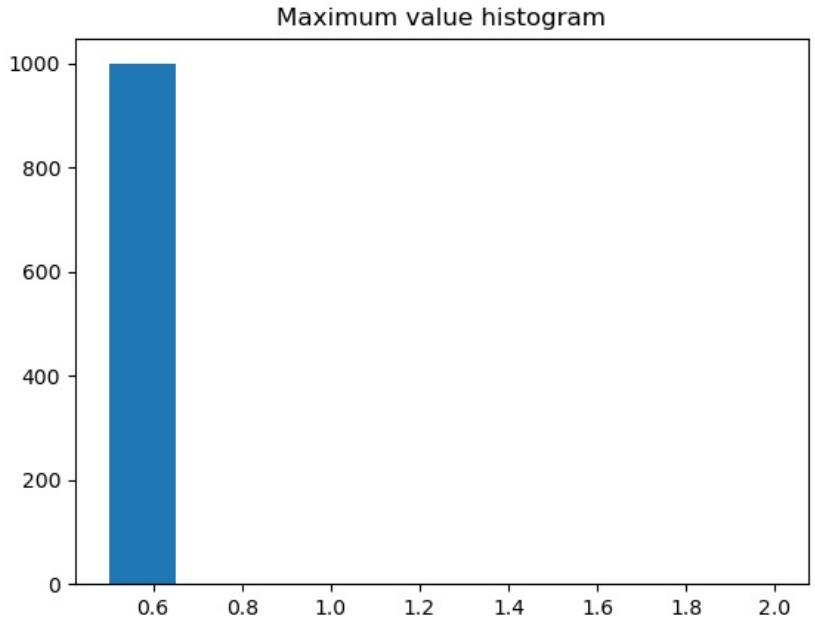

Figure 5: Maximum value histogram for all pulses