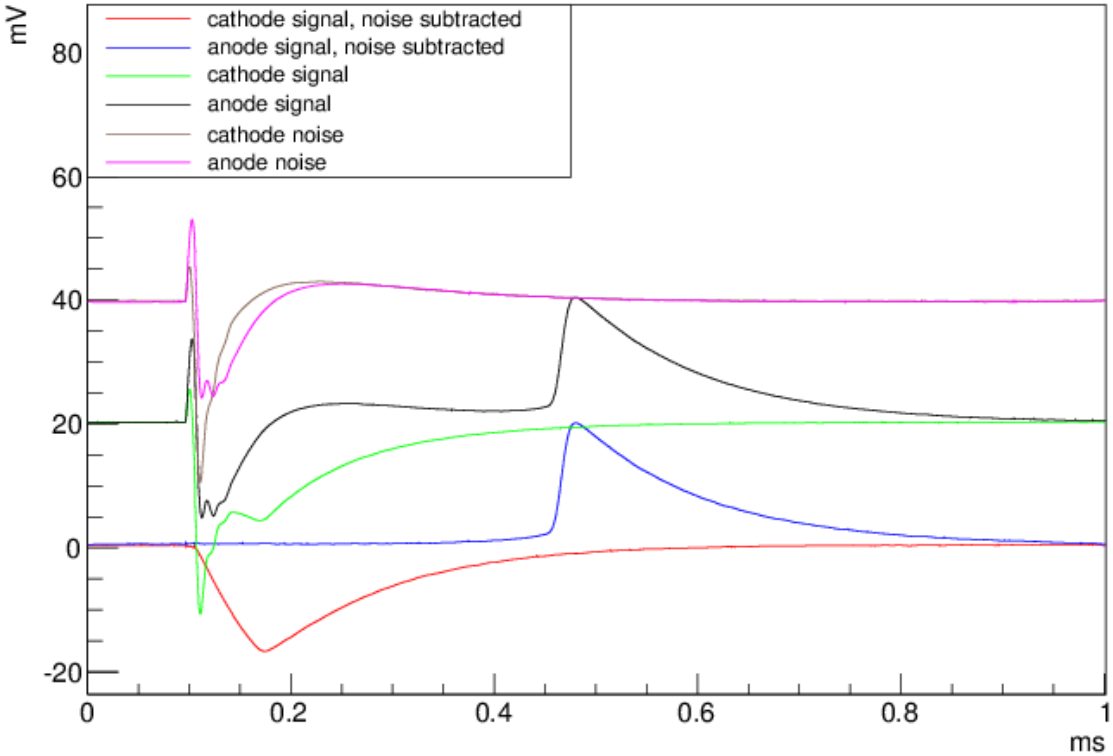
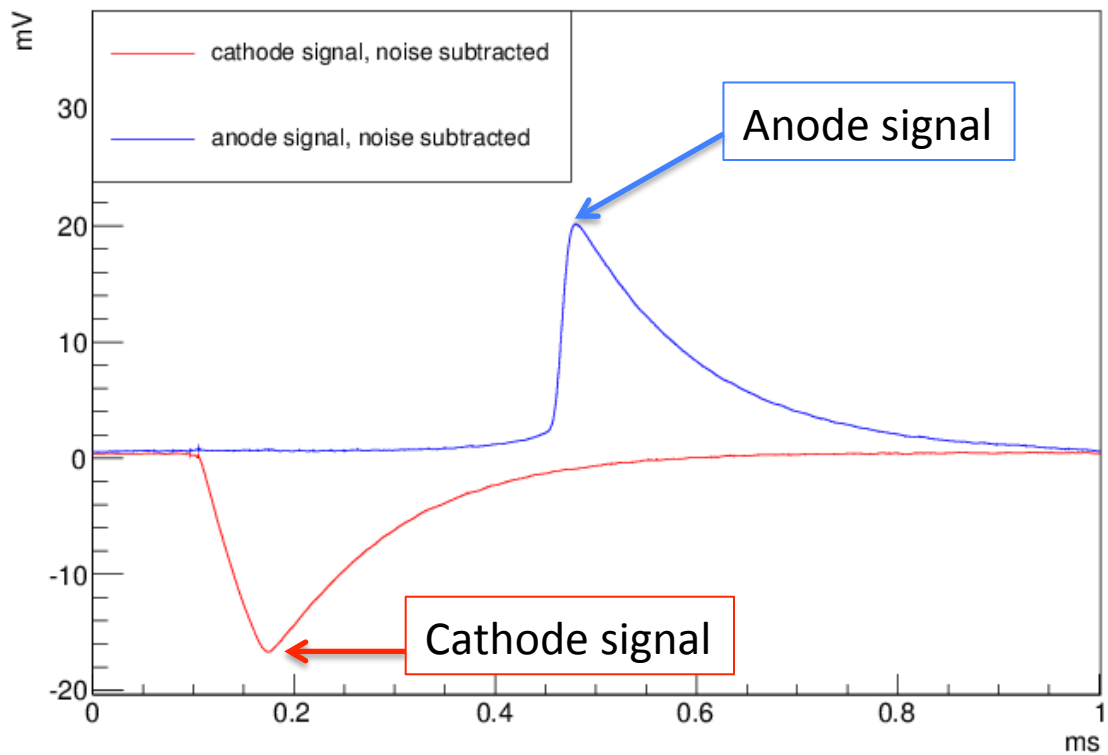
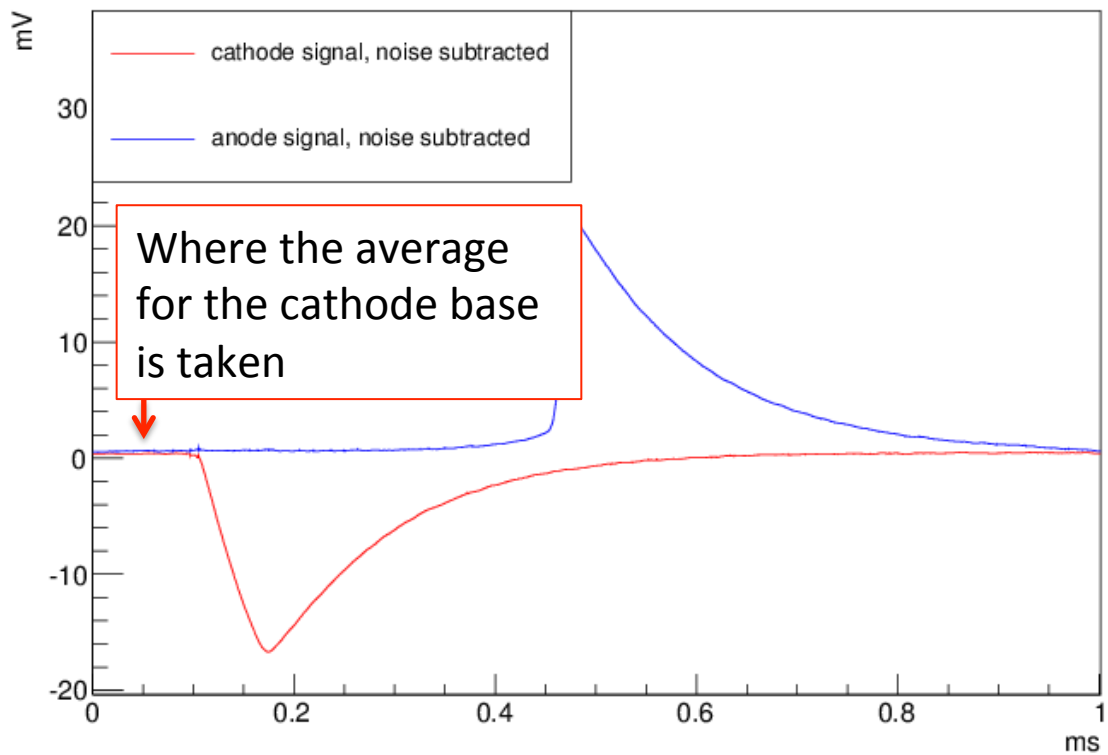


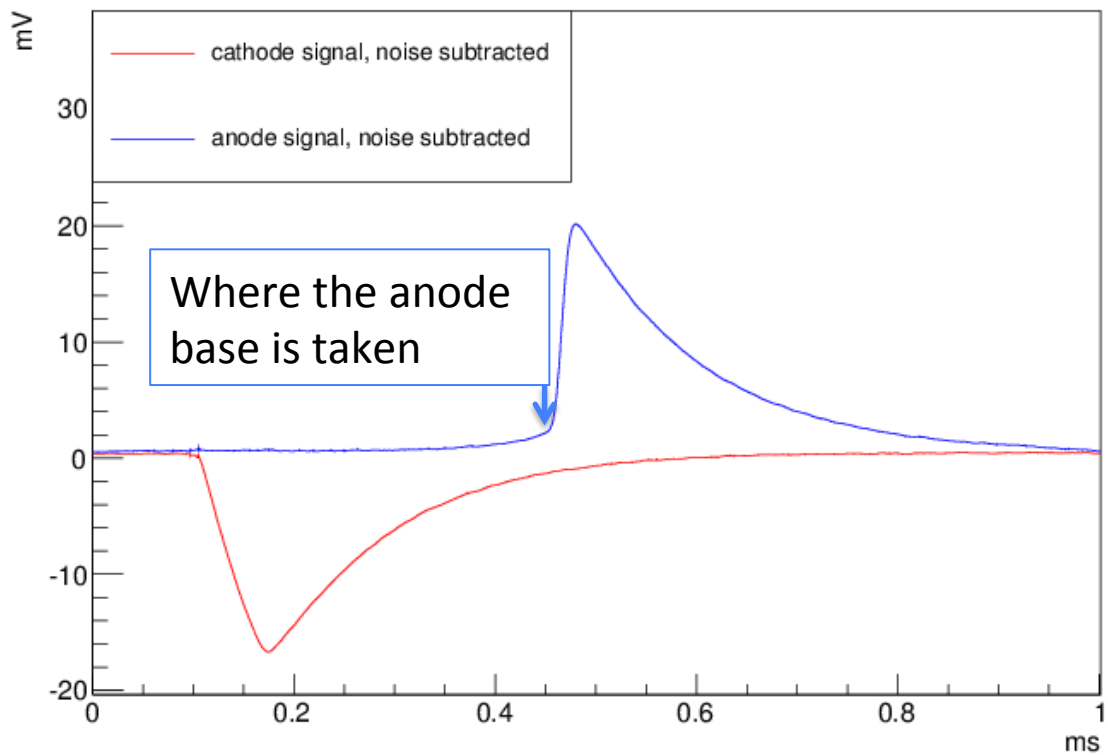
- We begin by subtracting noise (run flash lamp without HV) from signal (run flash lamp with HV)
- In the above for the cathode, we subtract the brown noise from the green signal to produce the red curve
- In the above for the anode, we subtract the pink noise from the black signal to produce the blue curve



- We now need to find the maximum voltages for the anode and cathode
- We search through all the samples in the record (5008 in this case)
- For this example, we find the maximum cathode peak of –16.7 mV at 0.17 ms and the maximum anode peak of 20 mV at 0.38 ms



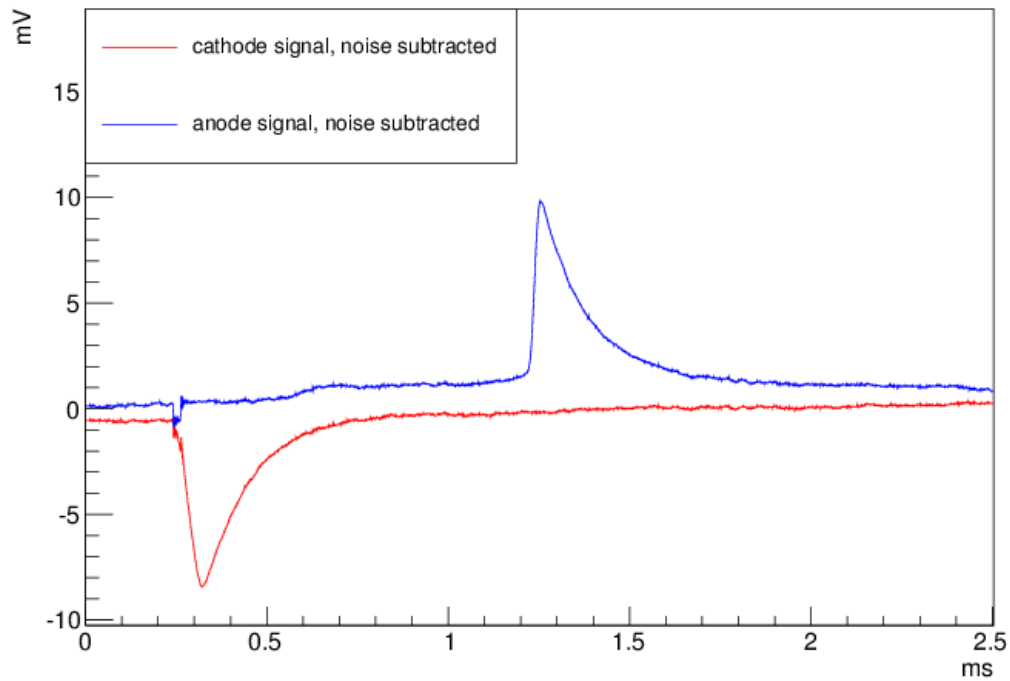
- The anode and cathode signals can appear added to a base voltage, which we will now subtract
- To determine what the base voltage is for the cathode, we average over 50 samples taken before half of the trigger time (0.05 ms here), the range is therefore 0.045 ms to 0.055 ms
- The base for the cathode signal in this example is 0.4 mV



- The anode base is determined differently from that of the cathode
- The time we look at the anode base is determined by looking at the time the anode is at its max minus 10% of the difference between the times when the anode and cathodes are at their max (the anode max is at 0.48 ms and the cathode at 0.17 ms)
- This ends up being at 0.45 ms = 0.48 ms – 0.1(0.48 ms – 0.17 ms), giving us a base of 2.1 mV

Further examples

Run 2514, PrM 0

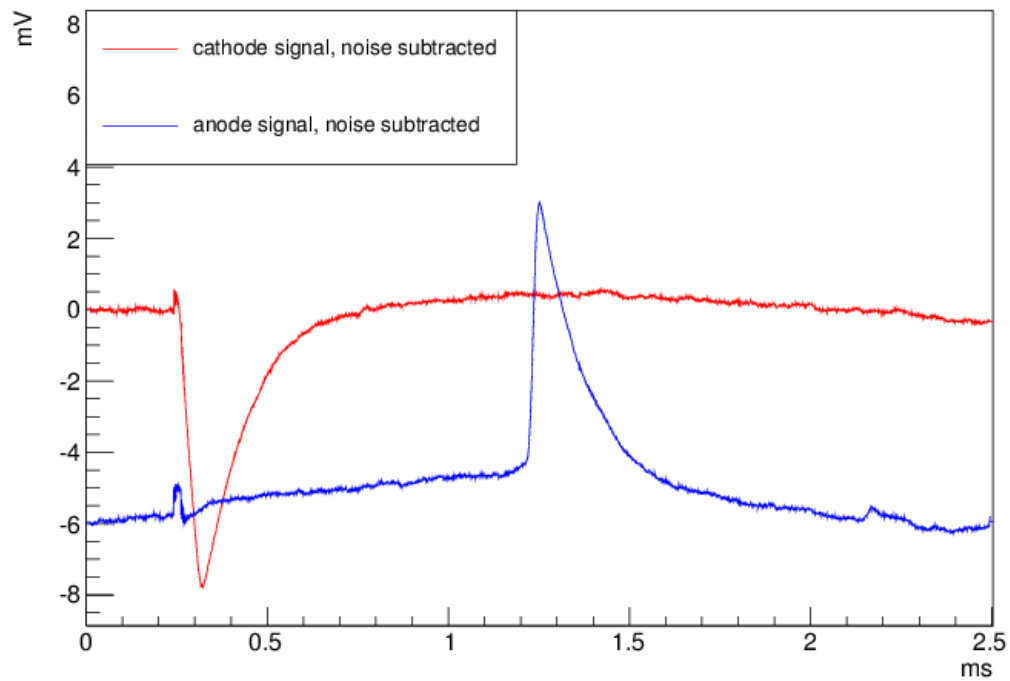


Cathode peak = –8.4 mV
Cathode peak time = 0.32 ms
Cathode base = –0.6 mV
Cathode factor = 1.36
Cathode true = 10.7 mV

Anode peak = 9.8 mV
Anode peak time = 1.25 ms
Anode base = 1.3 mV
Anode factor = 1.12
Anode true = 10.0 mV

Lifetime = 15.5 ms = 1.00 ms /log(10.7 mV/10.0 mV)

Run 2523, PrM 0

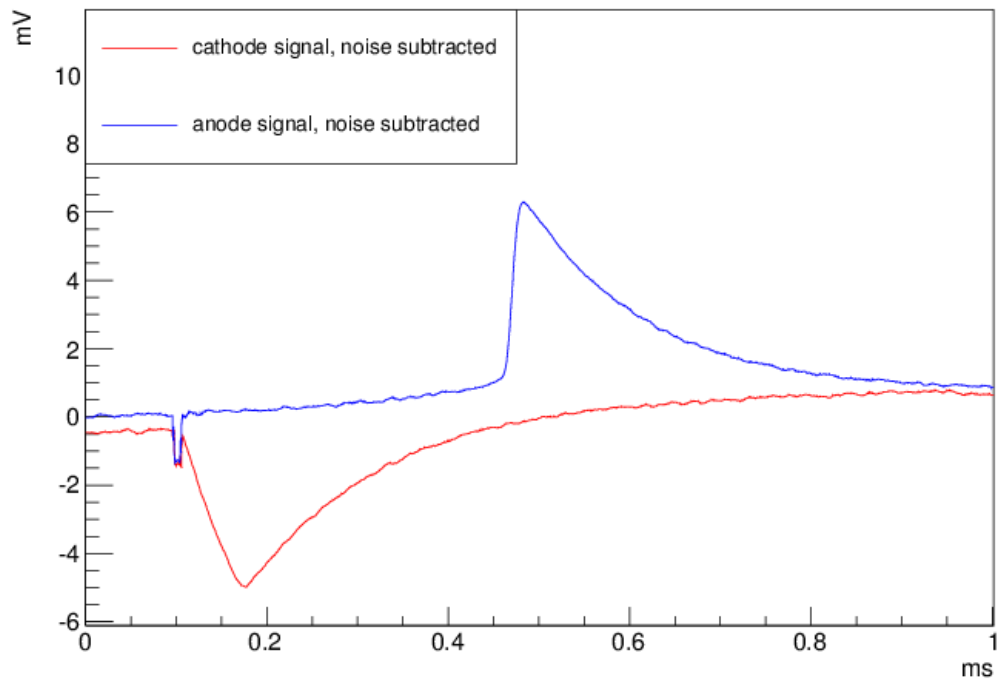


Cathode peak = –7.8 mV
Cathode peak time = 0.32 ms
Cathode base = 0.0 mV
Cathode factor = 1.36
Cathode true = 10.6 mV

Anode peak = 3.0 mV
Anode peak time = 1.25 ms
Anode base = –4.6 mV
Anode factor = 1.12
Anode true = 9.0 mV

Lifetime = 5.9 ms = 1.00 ms /log(10.6 mV/9.0 mV)

Run 2514, PrM 1

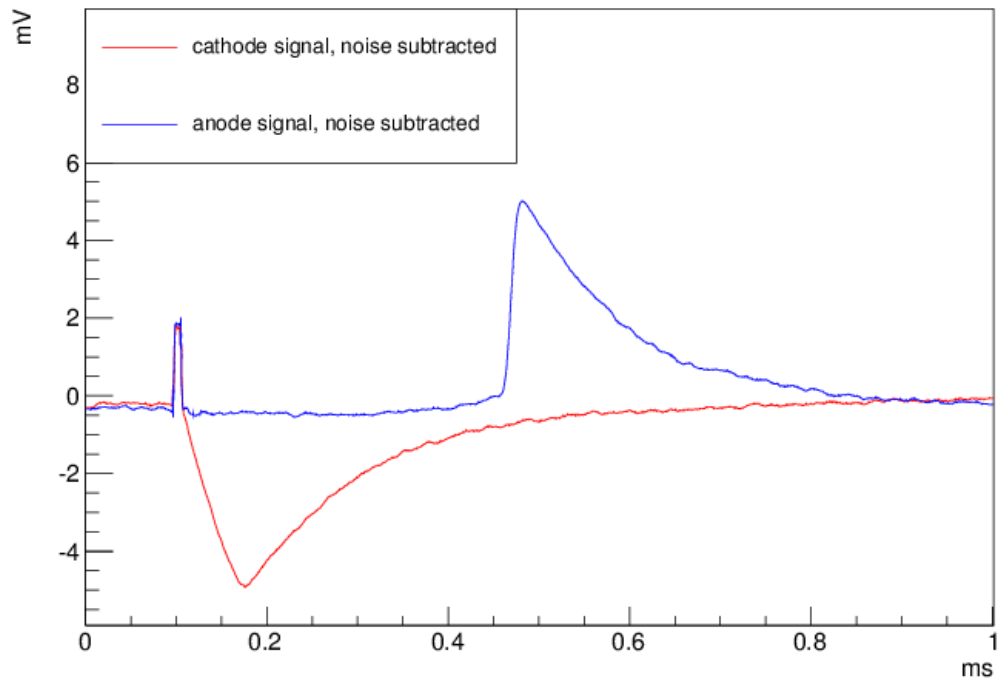


Cathode peak = –5.0 mV
Cathode peak time = 0.17 ms
Cathode base = –0.4 mV
Cathode factor = 1.39
Cathode true = 6.3 mV

Anode peak = 6.3 mV
Anode peak time = 0.48 ms
Anode base = 1 mV
Anode factor = 1.08
Anode true = 6.0 mV

Lifetime = 6.3 ms = 0.38 ms /log(6.3 mV/6.0 mV)

Run 2524, PrM 1

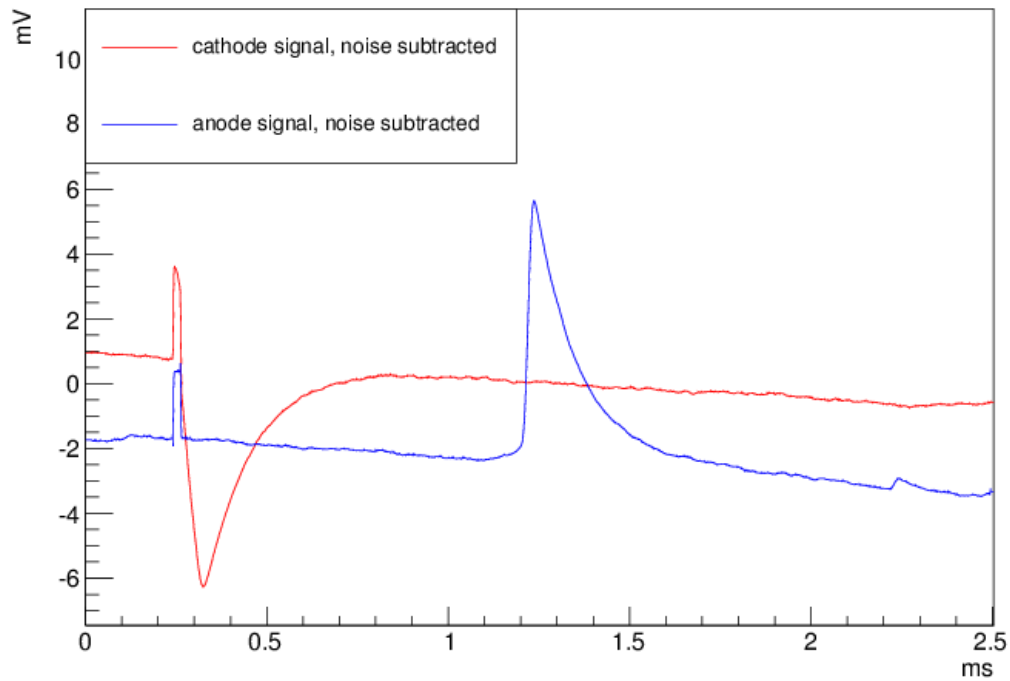


Cathode peak = –4.9 mV
Cathode peak time = 0.17 ms
Cathode base = –0.2 mV
Cathode factor = 1.39
Cathode true = 6.5 mV

Anode peak = 5.0 mV
Anode peak time = 0.48 ms
Anode base = 0.0 mV
Anode factor = 1.08
Anode true = 5.7 mV

Lifetime = 2.7 ms = 0.38 ms /log(6.5 mV/5.7 mV)

Run 2518, PrM 3

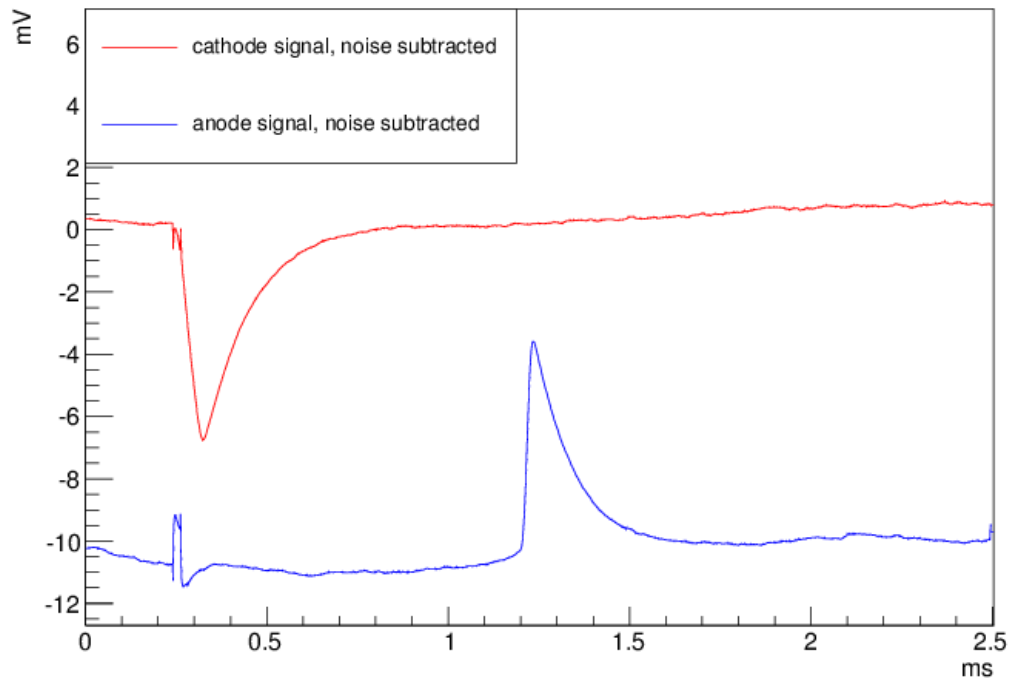


Cathode peak = –6.3 mV
Cathode peak time = 0.32 ms
Cathode base = 0.9 mV
Cathode factor = 1.38
Cathode true = 9.8 mV

Anode peak = 5.6 mV
Anode peak time = 1.24 ms
Anode base = –2.2 mV
Anode factor = 1.12
Anode true = 9.3 mV

Lifetime = 16.5 ms = 0.99 ms /log(9.8 mV/9.3 mV)

Run 2523, PrM 3

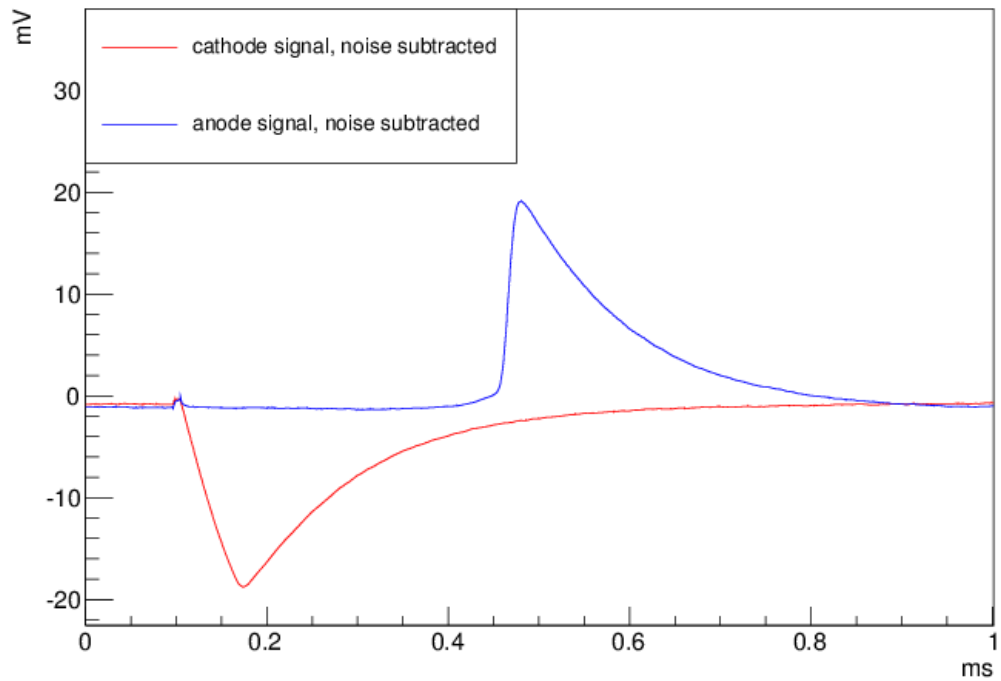


Cathode peak = –6.7 mV
Cathode peak time = 0.32 ms
Cathode base = 0.2 mV
Cathode factor = 1.38
Cathode true = 9.6 mV

Anode peak = –3.6 mV
Anode peak time = 1.23 ms
Anode base = –10.6 mV
Anode factor = 1.12
Anode true = 8.3 mV

Lifetime = 6.6 ms = 0.984 ms /log(9.6 mV/8.3 mV)

Run 2522, PrM 4

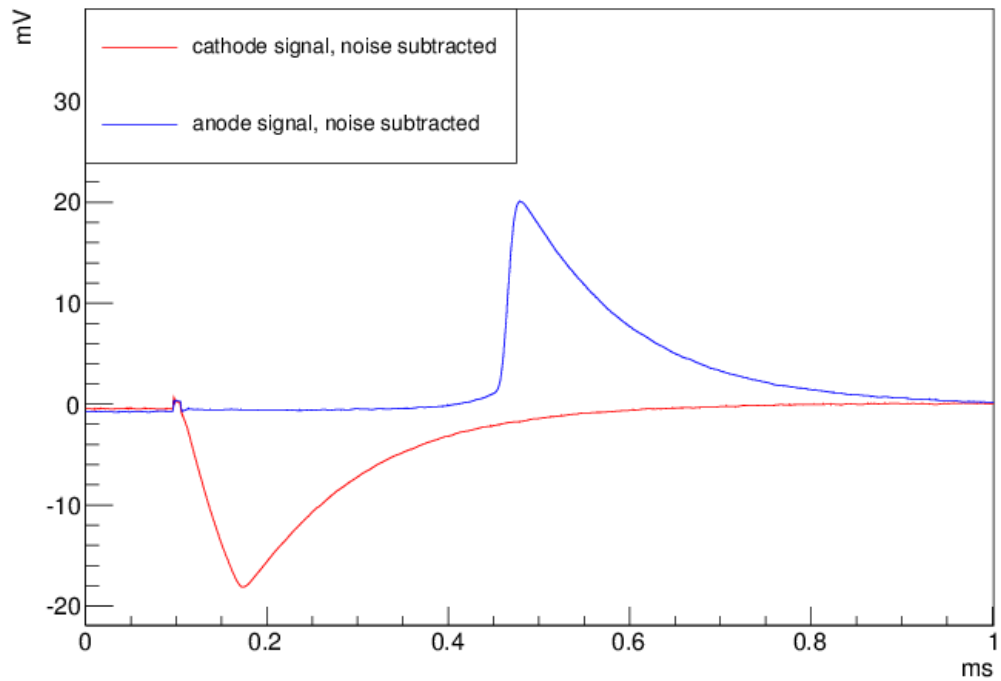


Cathode peak = –18.8 mV
Cathode peak time = 0.17 ms
Cathode base = –0.8 mV
Cathode factor = 1.37
Cathode true = 24.6 mV

Anode peak = 19.1 mV
Anode peak time = 0.48 ms
Anode base = 0.0 mV
Anode factor = 1.09
Anode true = 21.7 mV

Lifetime = 3.0 ms = 0.38 ms /log(24.6 mV/21.7 mV)

Run 2524, PrM 4

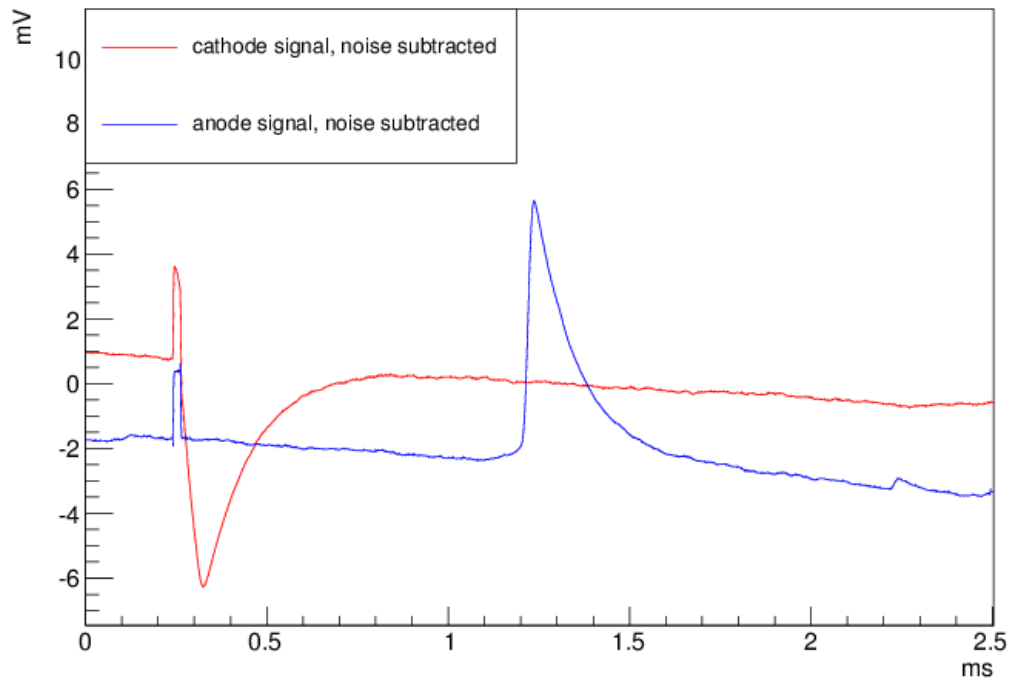


Cathode peak = –18.8 mV
Cathode peak time = 0.17 ms
Cathode base = –0.5 mV
Cathode factor = 1.37
Cathode true = 24.3 mV

Anode peak = 20.1 mV
Anode peak time = 0.48 ms
Anode base = 1.0 mV
Anode factor = 1.09
Anode true = 21.8 mV

Lifetime = 3.5 ms = 0.38 ms /log(24.3 mV/21.8 mV)

Go back to Run 2518, PrM 3

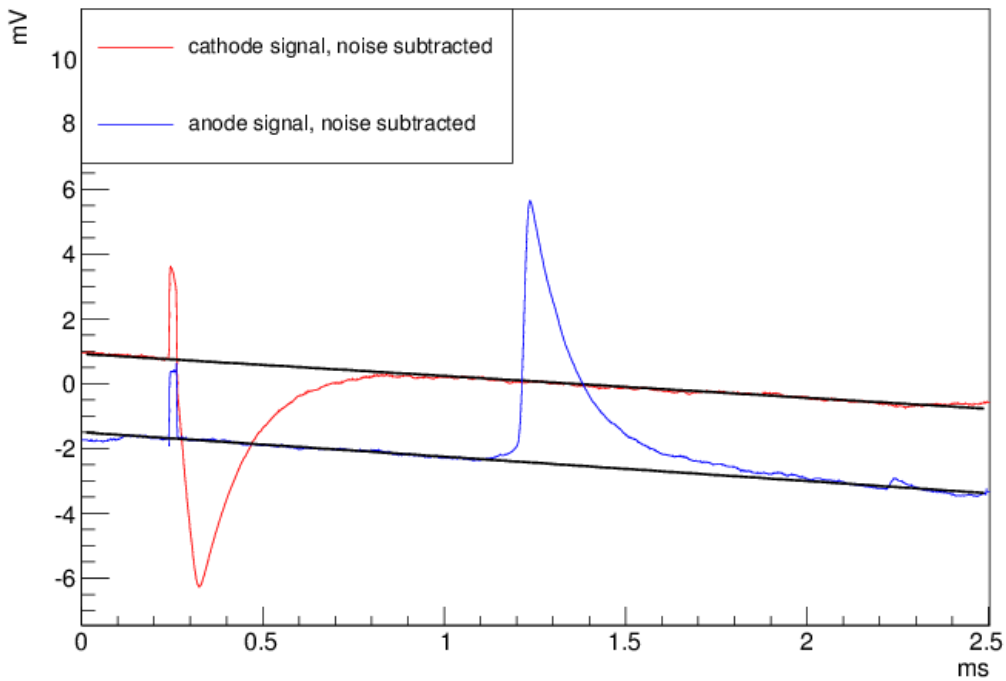


Cathode peak = –6.3 mV
Cathode peak time = 0.32 ms
Cathode base = 0.9 mV
Cathode factor = 1.38
Cathode true = 9.8 mV

Anode peak = 5.6 mV
Anode peak time = 1.24 ms
Anode base = –2.2 mV
Anode factor = 1.12
Anode true = 9.3 mV

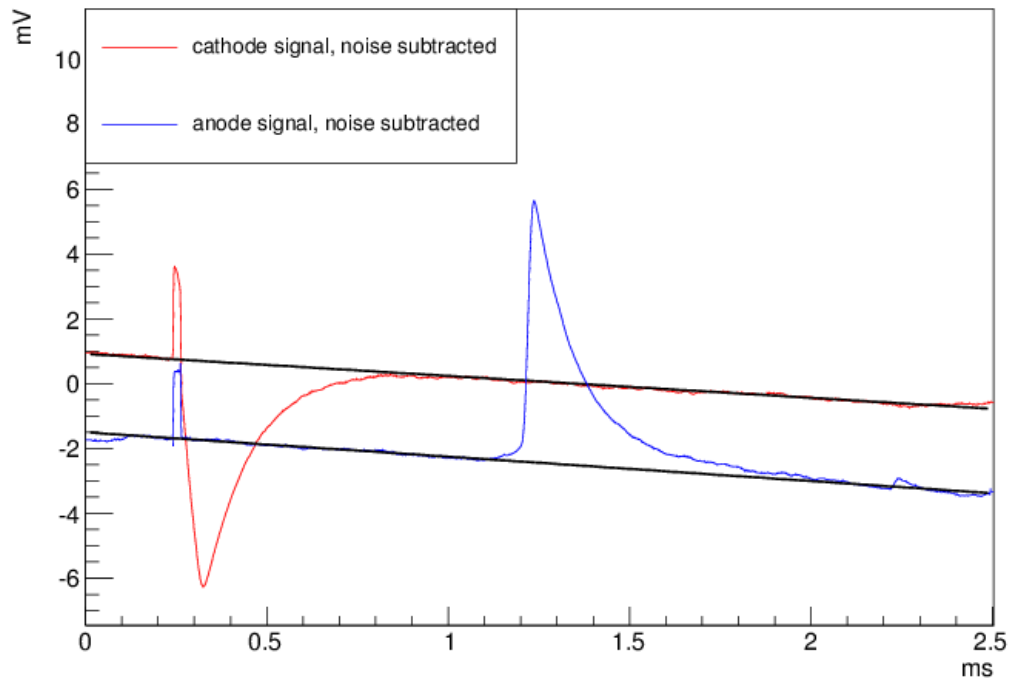
Lifetime = 16.5 ms = 0.99 ms /log(9.8 mV/9.3 mV)

What if we fit instead for the bases for Run 2518, PrM 3



- For the cathode, exclude the range 0.5 < t < 1.0 ms
- For the anode, exclude the range 0.5 < t and 1.0 < t < 2 ms

What if we fit instead for the cathode base for Run 2518, PrM 3



Cathode peak = –6.3 mV
Cathode peak time = 0.32 ms
Cathode base = 0.74 mV (was 0.87)
Cathode factor = 1.38
Cathode true = 9.6 mV (was 9.8)

Anode peak = 5.6 mV
Anode peak time = 1.24 ms
Anode base = –2.2 mV
Anode factor = 1.12
Anode true = 9.4 mV was (9.3)

Lifetime = 32.1 ms = 0.99 ms /log(9.6 mV/9.4 mV)