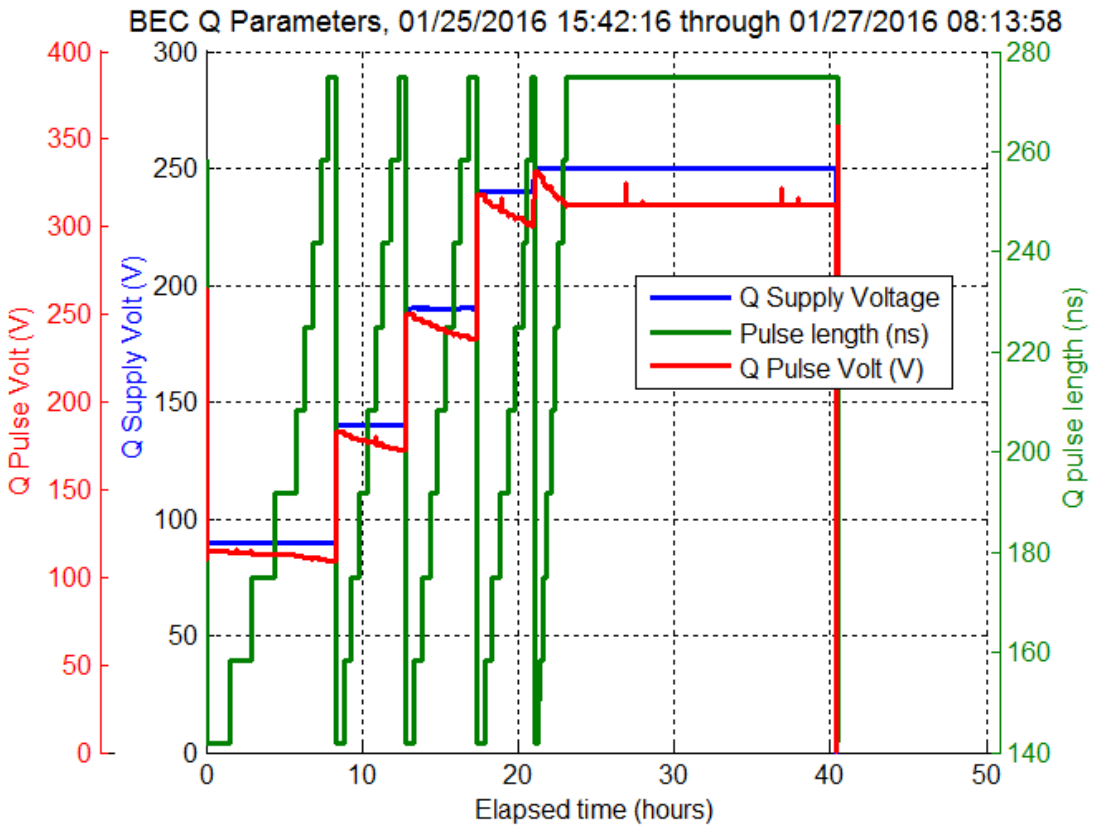
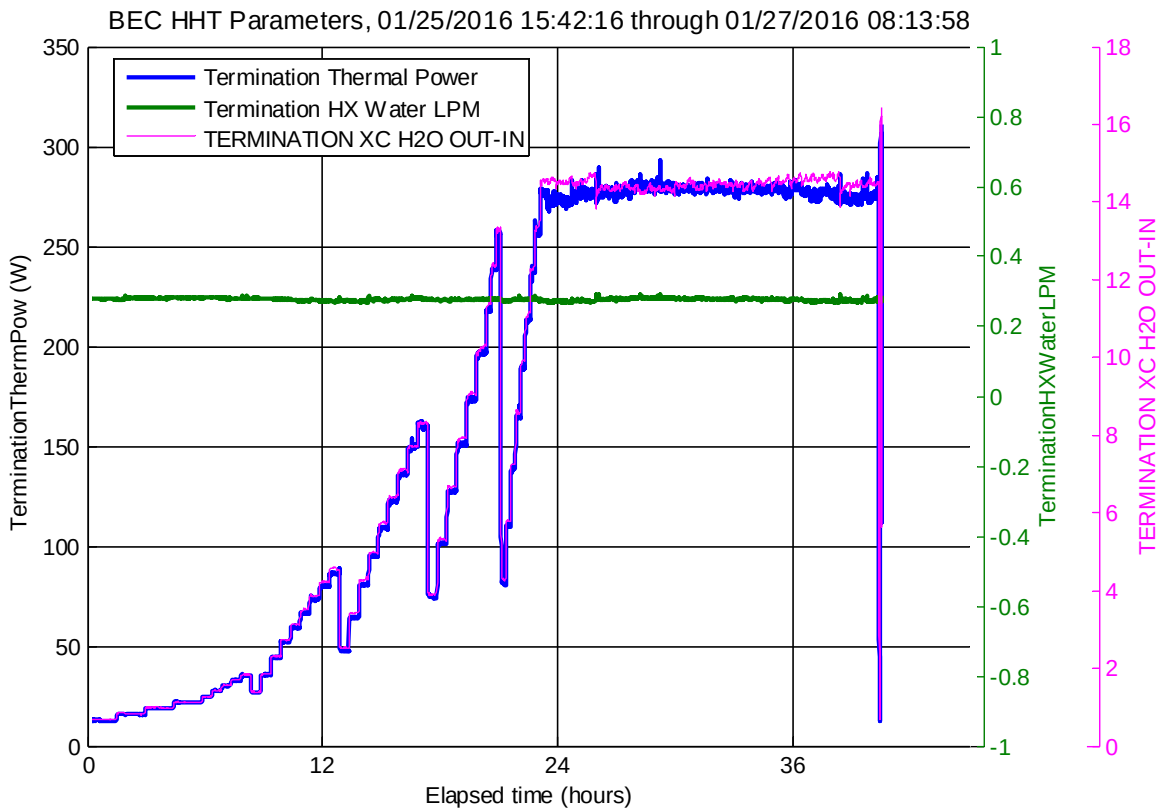
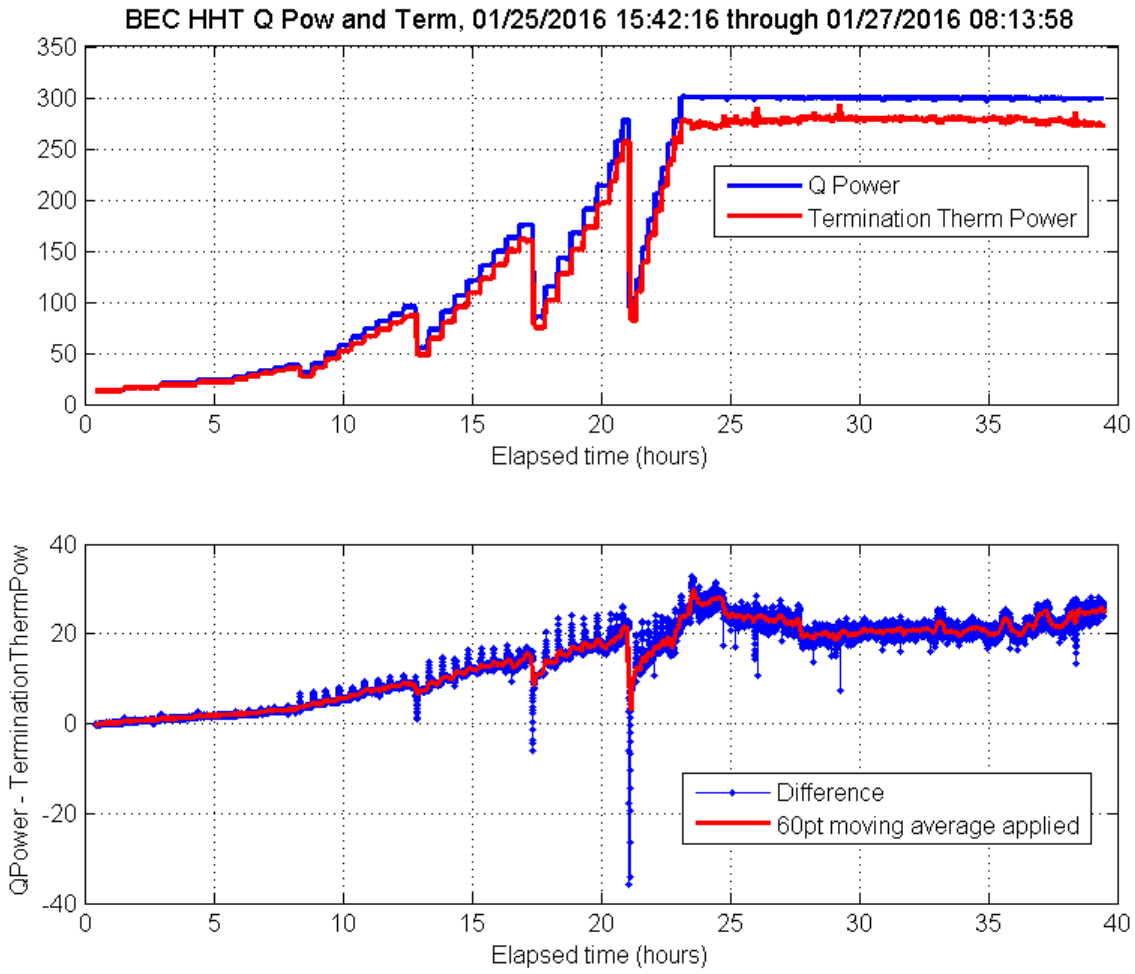
Analysis of data from BEC HHT where the pi filter on the q pulse board is connected directly to the termination, in order to measure the efficiency of the heat sink.

Directory: `C:\Users\jen_g\Data\ConF00_copy\2015-12-01`
Files: `HeatSinkVSpiCal_day-XX, 3 files from 1/25/16 to 1/27/16`

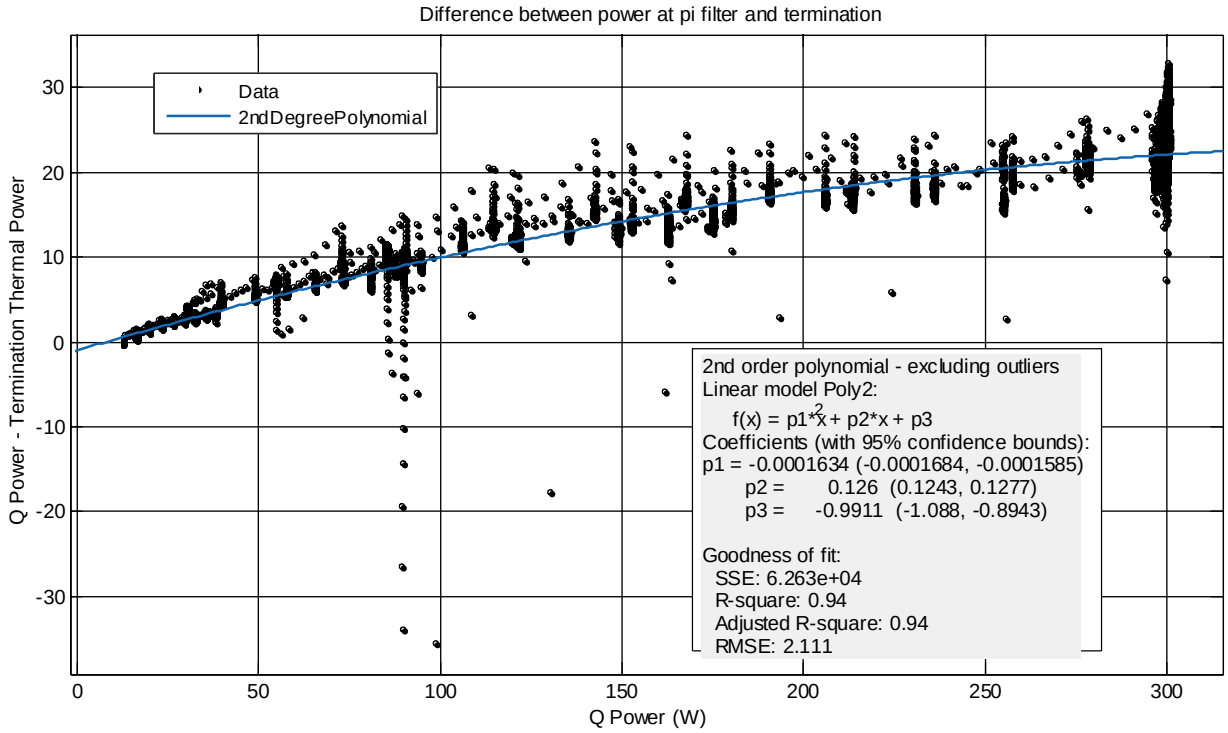
From the log file:
2016-01-26
~13:00 Started shorted Q sweep to test efficiency of Termination heat sink.
21:00 realized I did not shorten the first variable, pulse width time, only the second one pulse voltage.



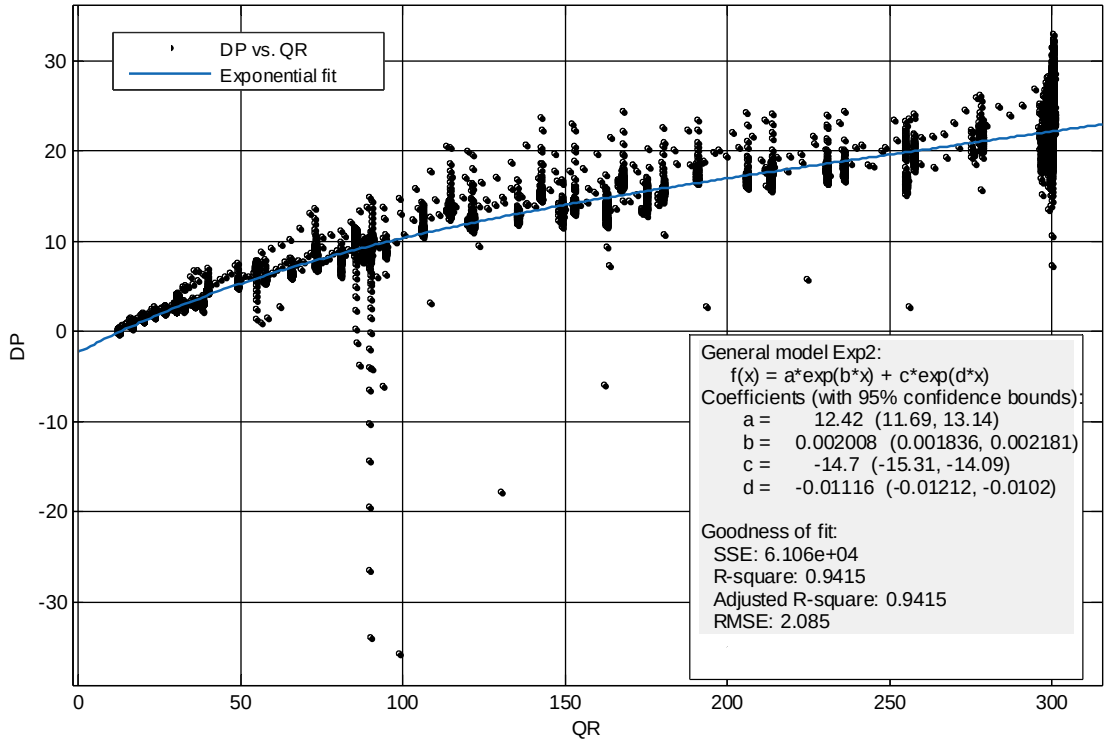

BEC HHT Parameters, 01/25/2016 15:42:16 through 01/27/2016 08:13:58
Termination Thermal Power
Termination HX Water LPM
TERMINATION XC H2O OUT-IN
TerminationThermPow (W)
TerminationHXWaterLPM
TERMINATION XC H2O OUT-IN
Elapsed time (hours)
0
12
24
36
0
50
100
150
200
250
300
350
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
0
2
4
6
8
10
12
14
16
18



First, plotting the power difference as a function of Q power, the curve fit looks fairly close to a second order polynomial. I'm not sure if this is what you expect, or if it should be broken down to a different, linear correction for each Q Voltage. The curve fit for the entire data set isn't great (even with the outliers excluded).

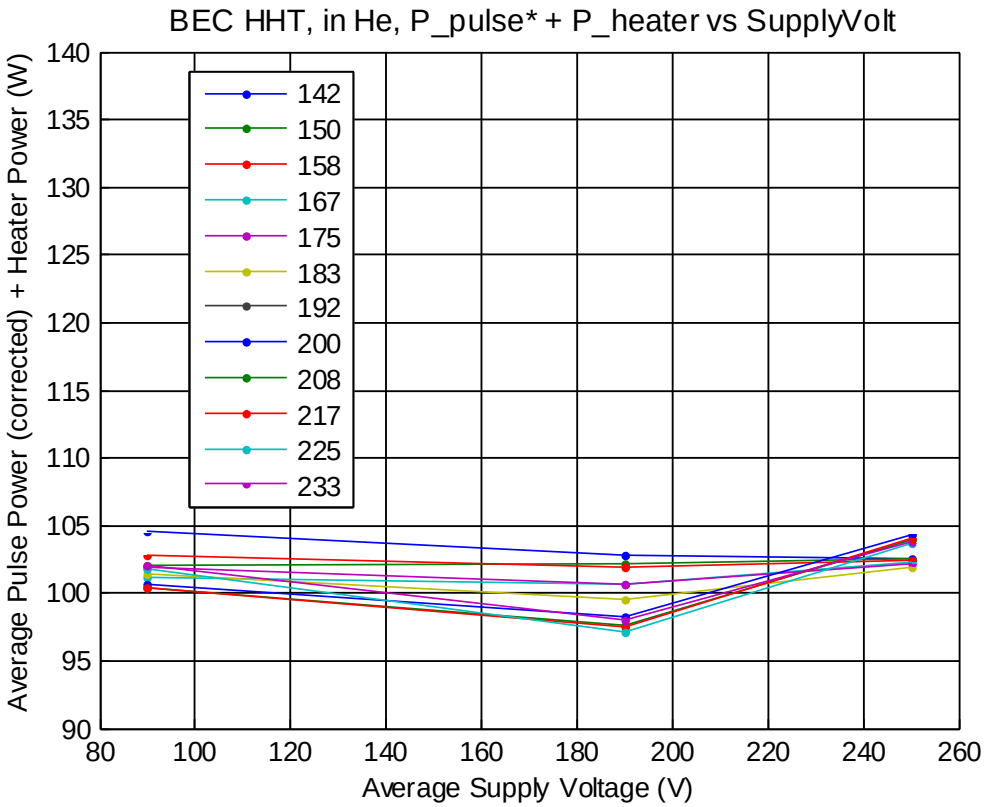


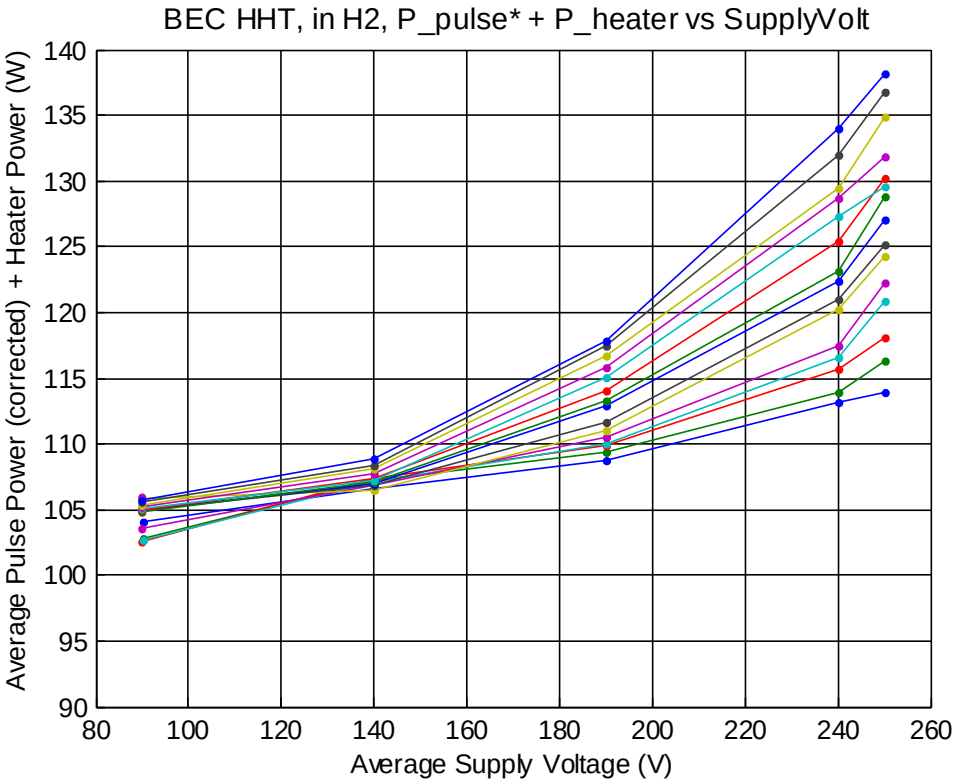
An exponential fit is only slightly better:

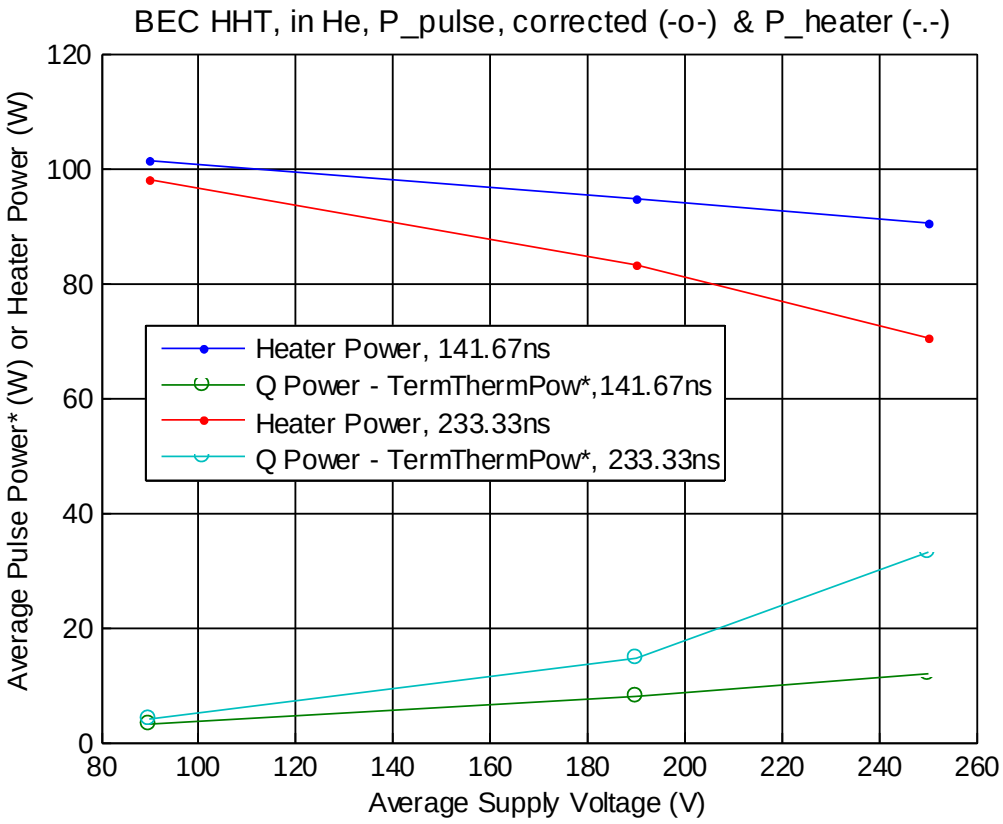


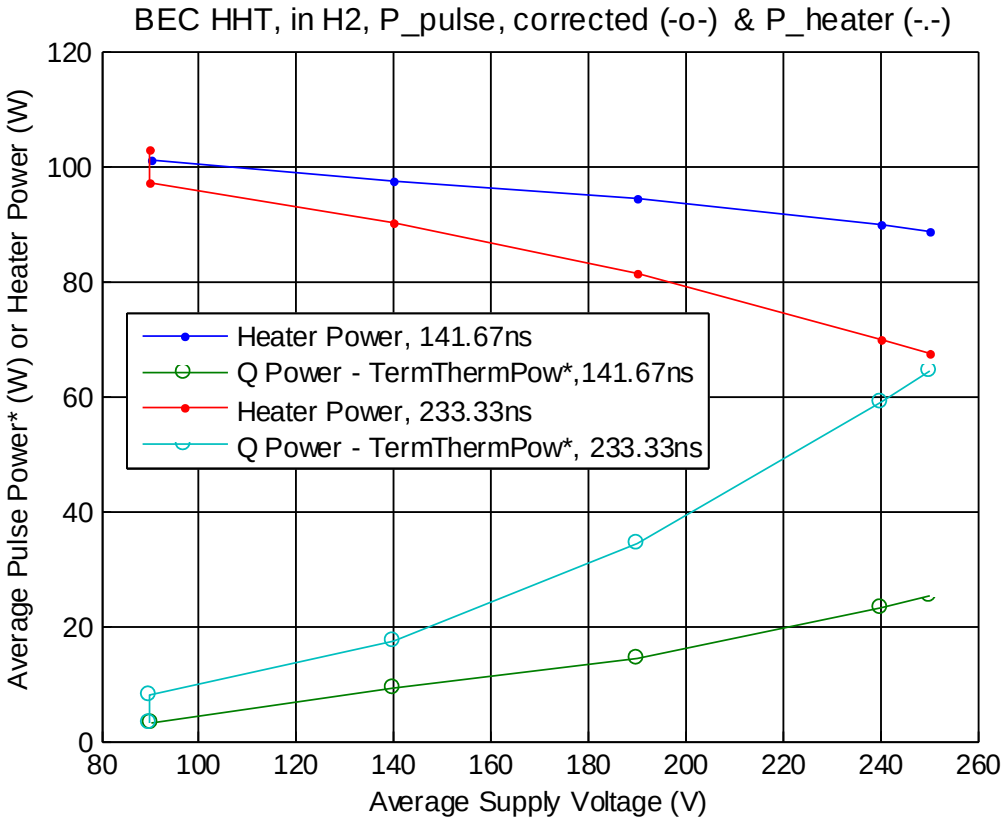
Applying the second model (exponential) to the Termination Thermal Power in the Q sequence experiment (i.e. subtracting the difference (f(x), above) from the Q Pulse Power (QPow-

TermThermPow) measured in the experiment, and labeled P_pulse), the corrected results from the January data are shown below.






BEC HHT, in He, P_pulse, corrected (-o-) & P_heater (-.-)
Average Pulse Power* (W) or Heater Power (W)
Average Supply Voltage (V)
Heater Power, 141.67ns
Q Power - TermThermPow*,141.67ns
Heater Power, 233.33ns
Q Power - TermThermPow*, 233.33ns
0
20
40
60
80
100
120
80
100
120
140
160
180
200
220
240
260


BEC HHT, in H2, P_pulse, corrected (-o-) & P_heater (-.-)
Average Pulse Power* (W) or Heater Power (W)
Average Supply Voltage (V)
Heater Power, 141.67ns
Q Power - TermThermPow*,141.67ns
Heater Power, 233.33ns
Q Power - TermThermPow*, 233.33ns
0
20
40
60
80
100
120
80
100
120
140
160
180
200
220
240
260