Summer Research Report Part 2 - Time Bins

July 21, 2022

1 Number of spikes in a time bin

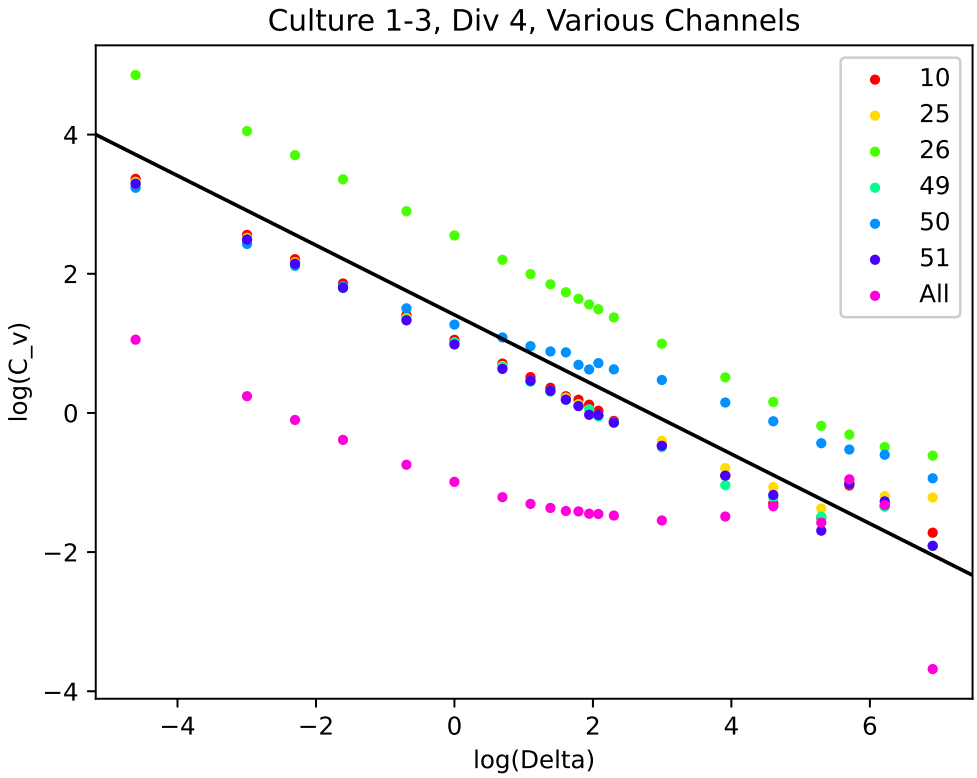
The following analysis is all done for Culture 1-3, div 4

If we let N_Δ be the number of spikes which occur in time bins of size Δ for a particular group of channels for a particular culture on a particular div, then we expect $N_\Delta \sim \text{Poi}(\lambda\Delta)$.

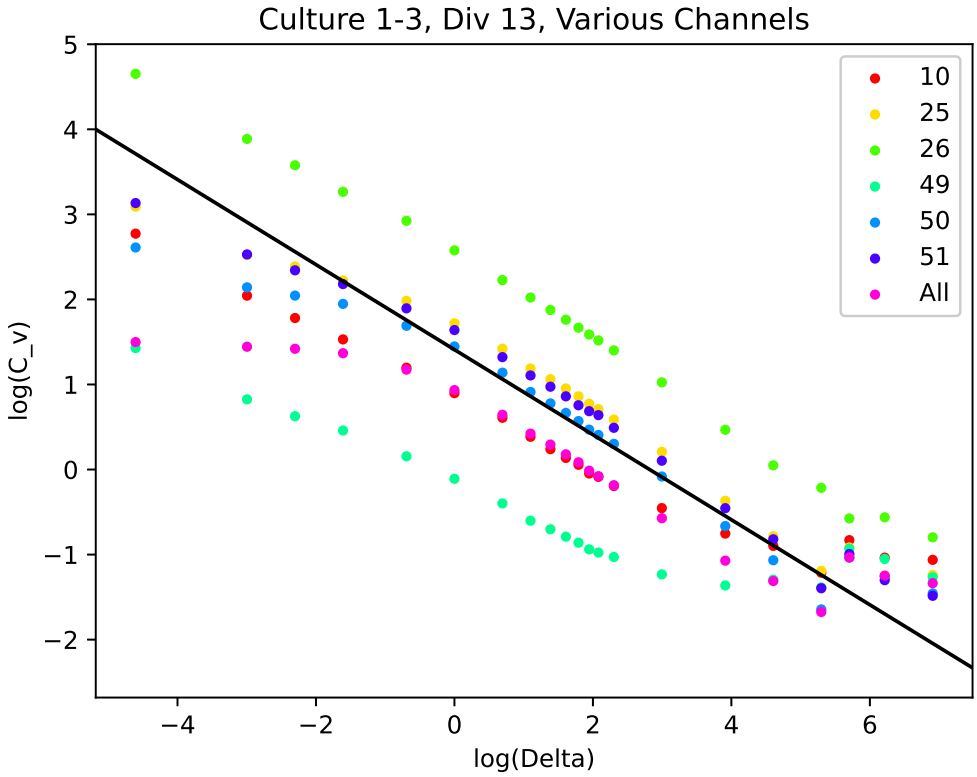
Therefore, we must have $C_v = (\lambda\Delta)^{-\frac{1}{2}}$

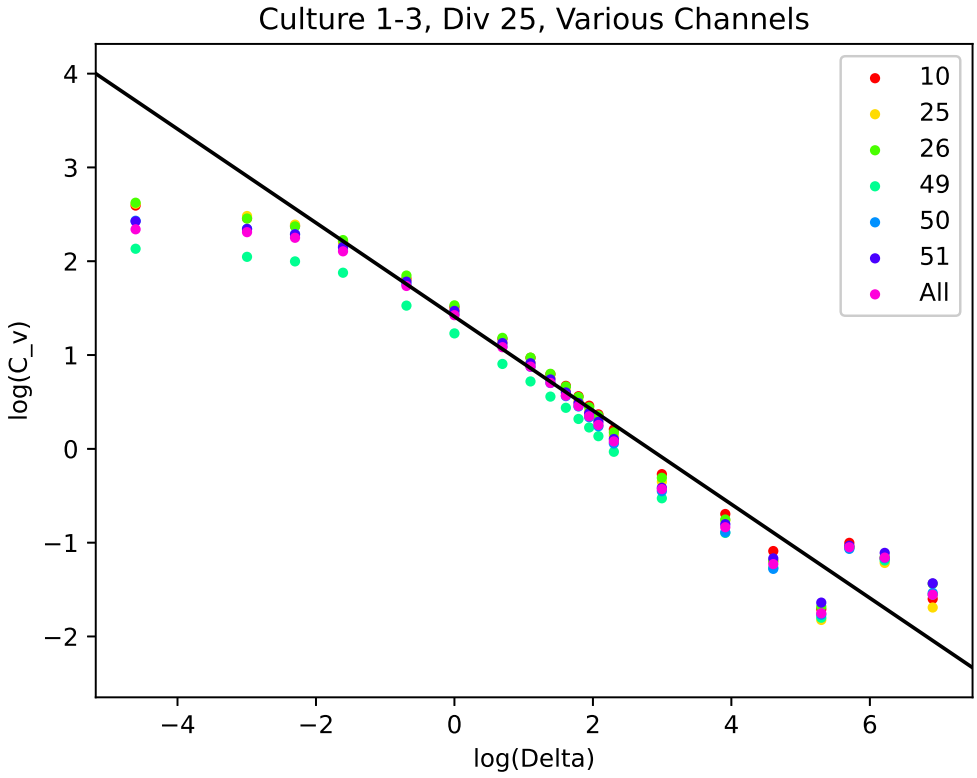
Since we looked at culture 1-3 previously (arbitrarily), we will do the same now. We plot a few graphs of $\ln C_v$ against $\ln \Delta$, expecting a slope of $-\frac{1}{2}$ and an intercept of $-\frac{1}{2}\ln\lambda$

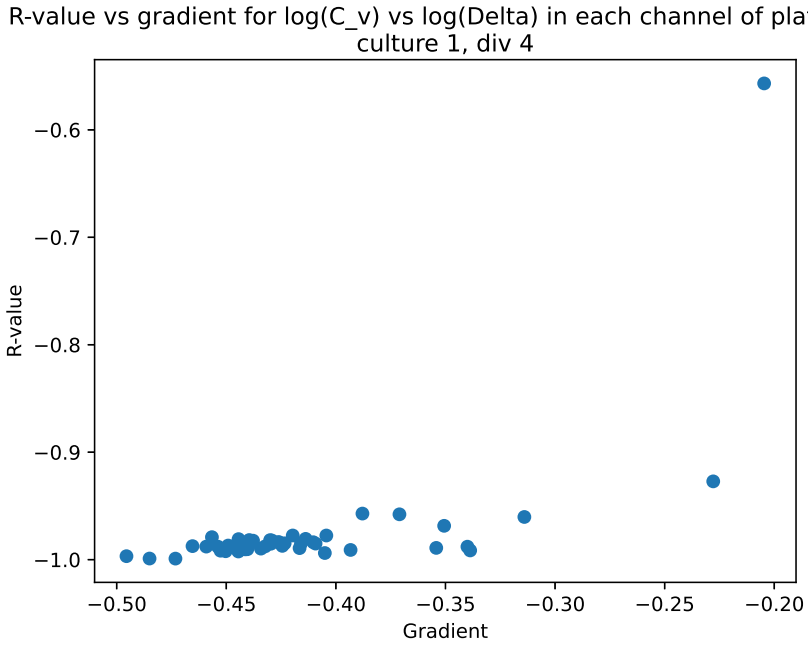
2 Log-log plots of several channels on different days

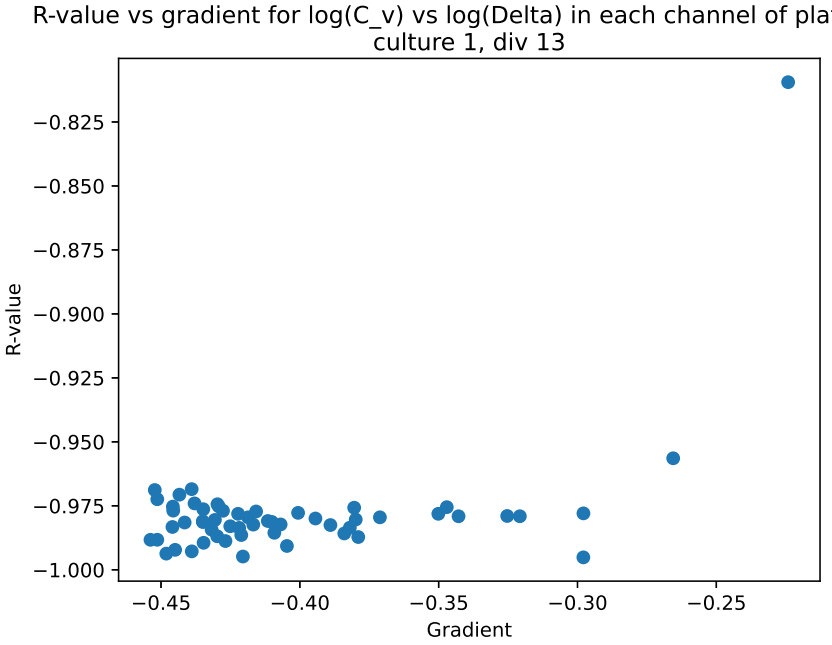


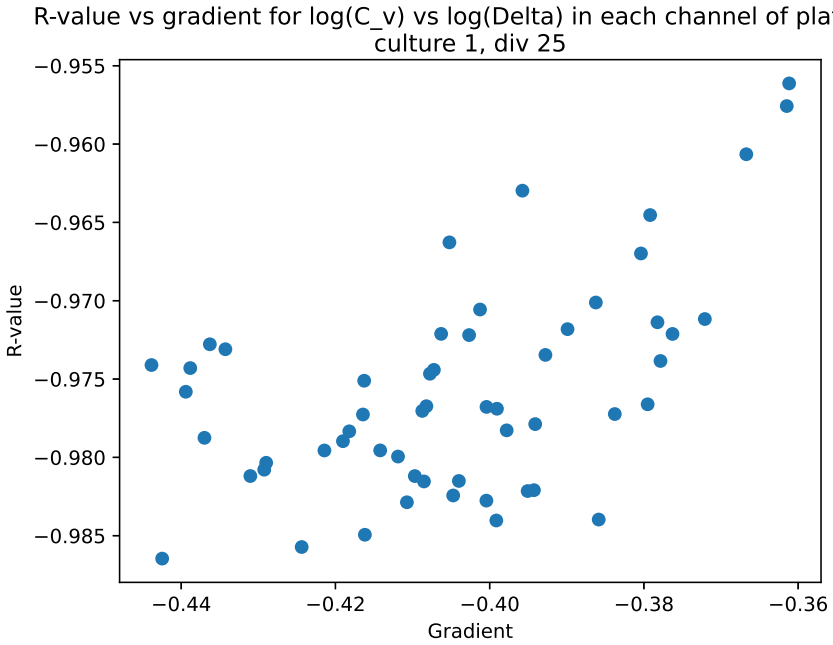
3 R-value vs gradient for log-log plots

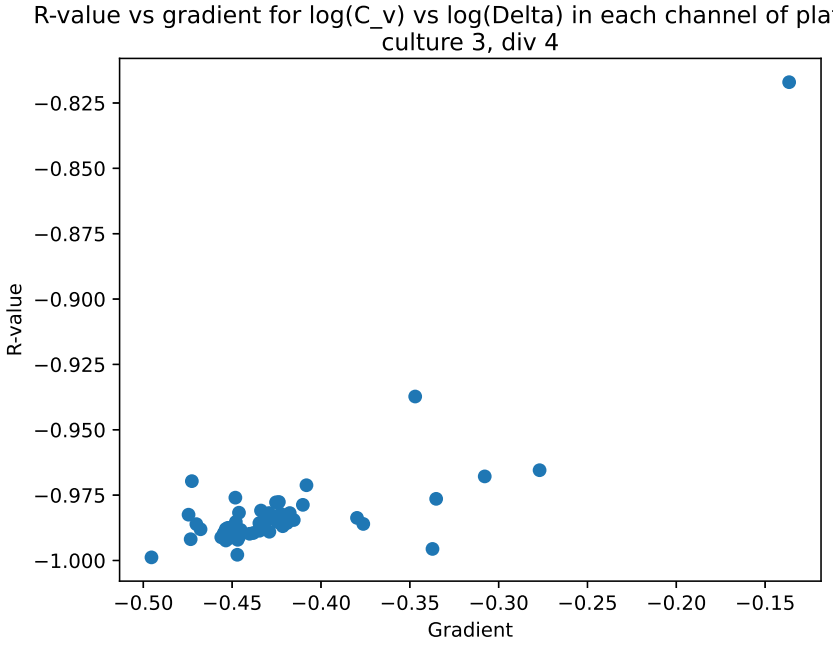

Culture 1-3, Div 13, Various Channels
log(C_v)
log(Delta)
10
25
26
49
50
51
All

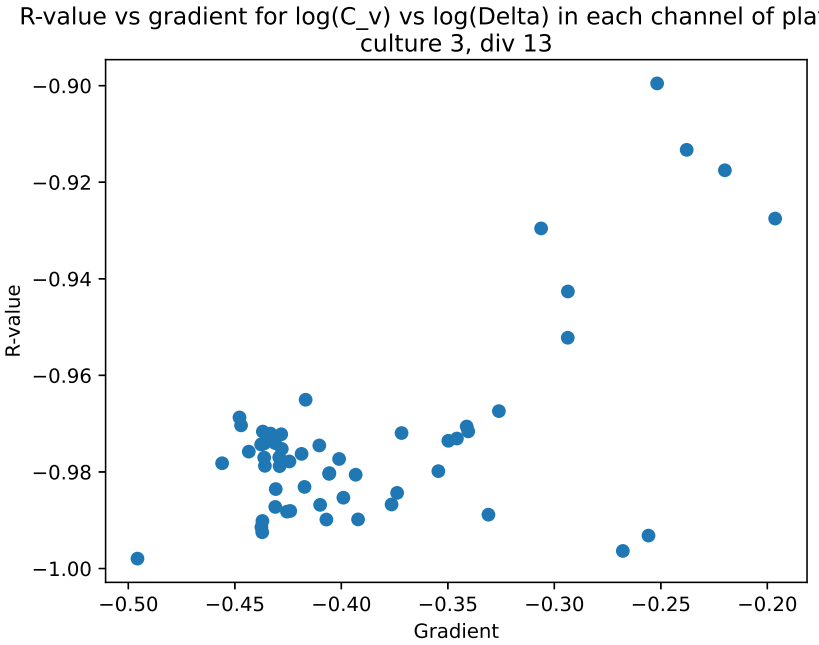

Culture 1-3, Div 25, Various Channels
log(C_v)
log(Delta)
10
25
26
49
50
51
All

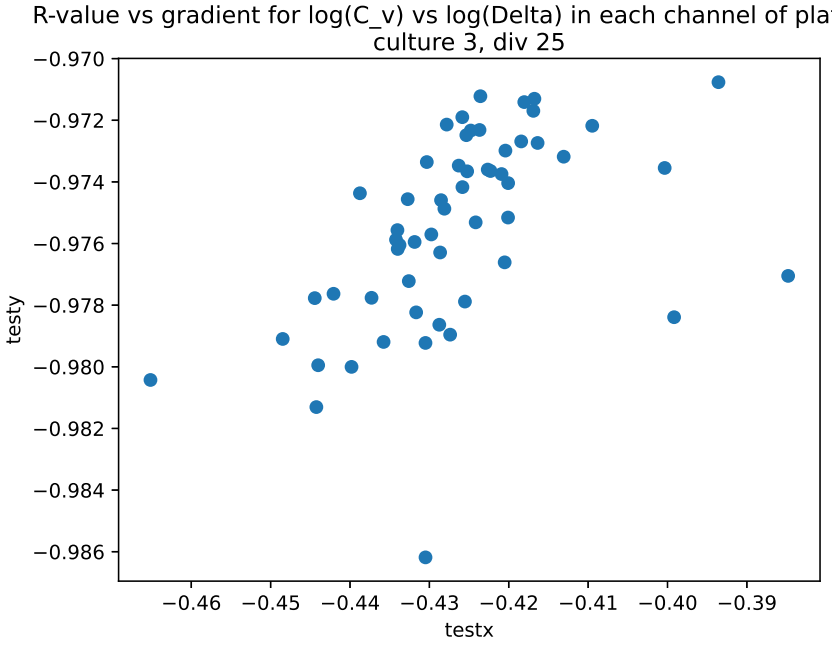

R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 1, culture 1, div 4
R-value
−0.6
−0.7
−0.8
−0.9
−1.0
−0.50
−0.45
−0.40
−0.35
−0.30
−0.25
−0.20
Gradient


R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 1, culture 1, div 13
R-value
−0.825
−0.850
−0.875
−0.900
−0.925
−0.950
−0.975
−1.000
−0.45
−0.40
−0.35
−0.30
−0.25
Gradient

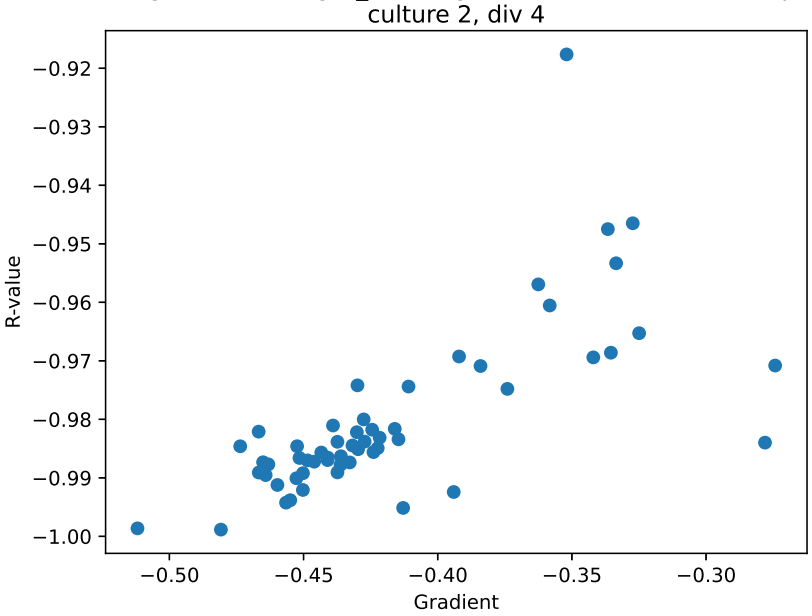

R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 1, culture 1, div 25
R-value
−0.955
−0.960
−0.965
−0.970
−0.975
−0.980
−0.985
−0.44
−0.42
−0.40
−0.38
−0.36
Gradient


R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 1, culture 3, div 4
R-value
−0.825
−0.850
−0.875
−0.900
−0.925
−0.950
−0.975
−1.000
−0.50
−0.45
−0.40
−0.35
−0.30
−0.25
−0.20
−0.15
Gradient

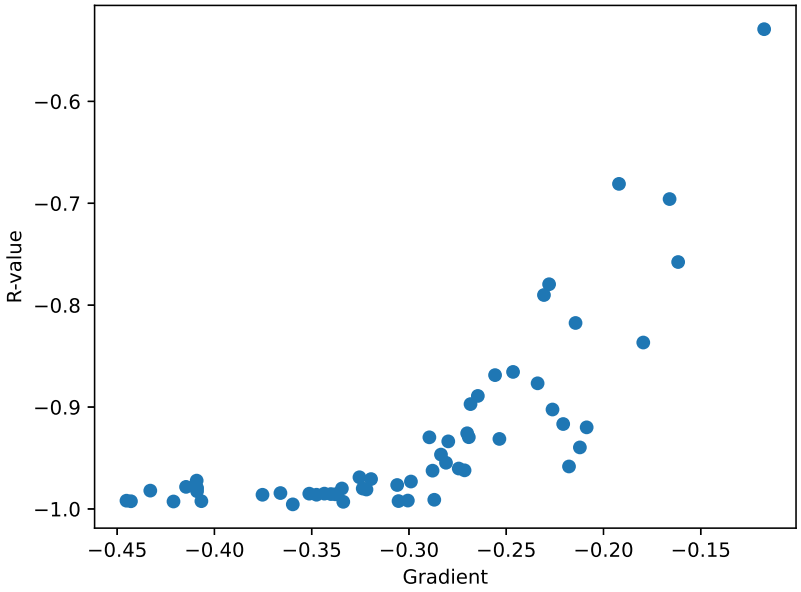

R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 1, culture 3, div 13
R-value
Gradient
−0.90
−0.92
−0.94
−0.96
−0.98
−1.00
−0.50
−0.45
−0.40
−0.35
−0.30
−0.25
−0.20

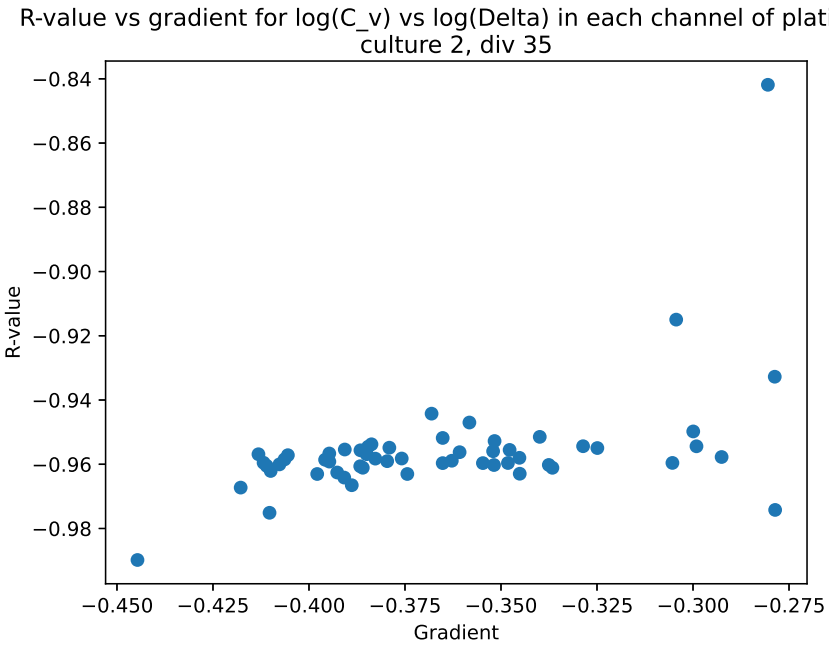

R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 1, culture 3, div 25
testy
testx
−0.970
−0.972
−0.974
−0.976
−0.978
−0.980
−0.982
−0.984
−0.986
−0.46
−0.45
−0.44
−0.43
−0.42
−0.41
−0.40
−0.39

R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 2, culture 2, div 4



R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 2, culture 2, div 14




R-value vs gradient for log(C_v) vs log(Delta) in each channel of plating 2, culture 2, div 35
R-value
−0.84
−0.86
−0.88
−0.90
−0.92
−0.94
−0.96
−0.98
−0.450
−0.425
−0.400
−0.375
−0.350
−0.325
−0.300
−0.275
Gradient