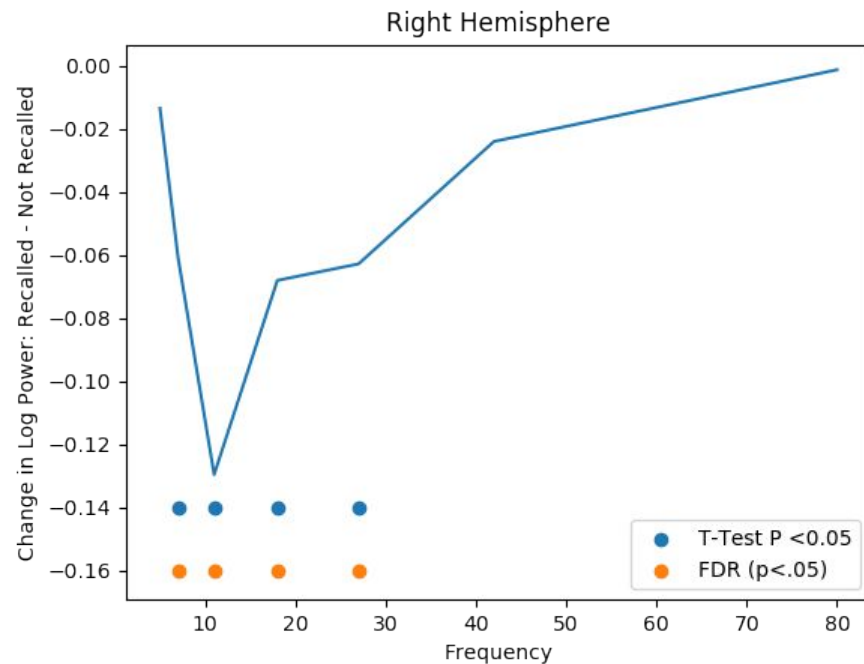
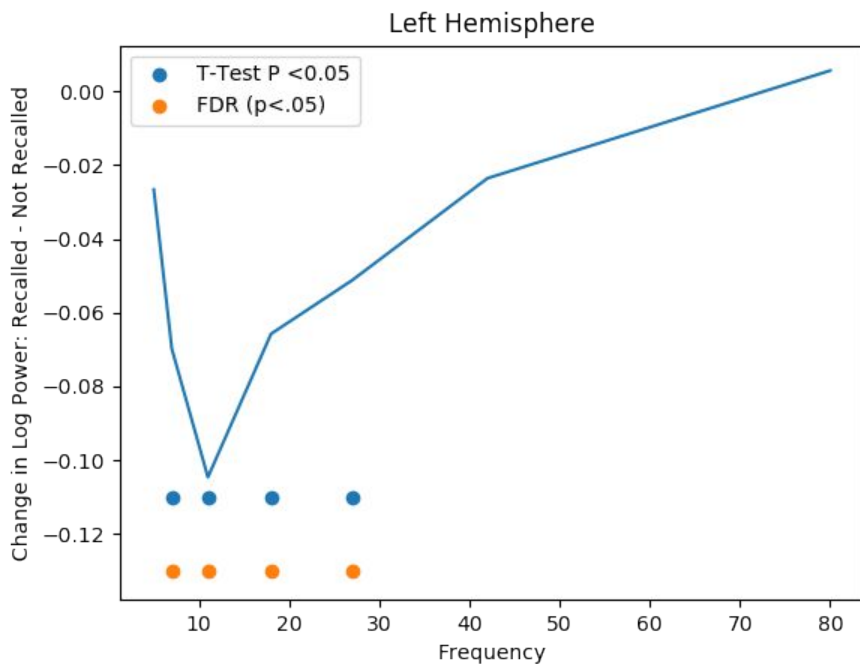


SME in the Frequency Domain

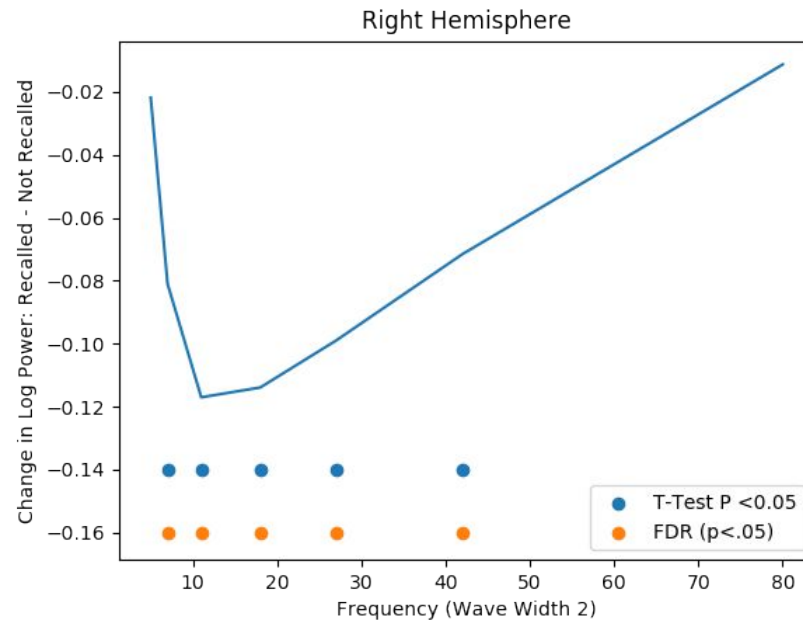
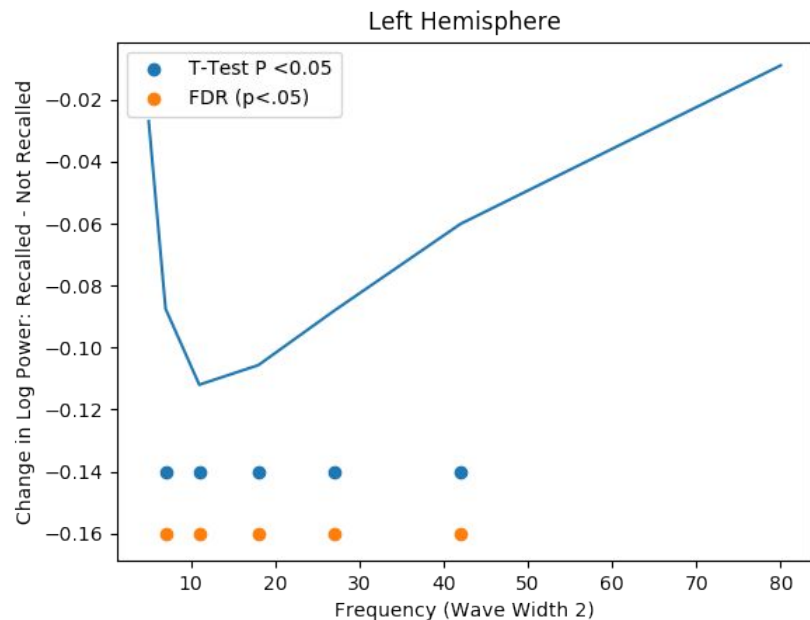
Jonathan Levine: Assignment 4

Wave Width of 6



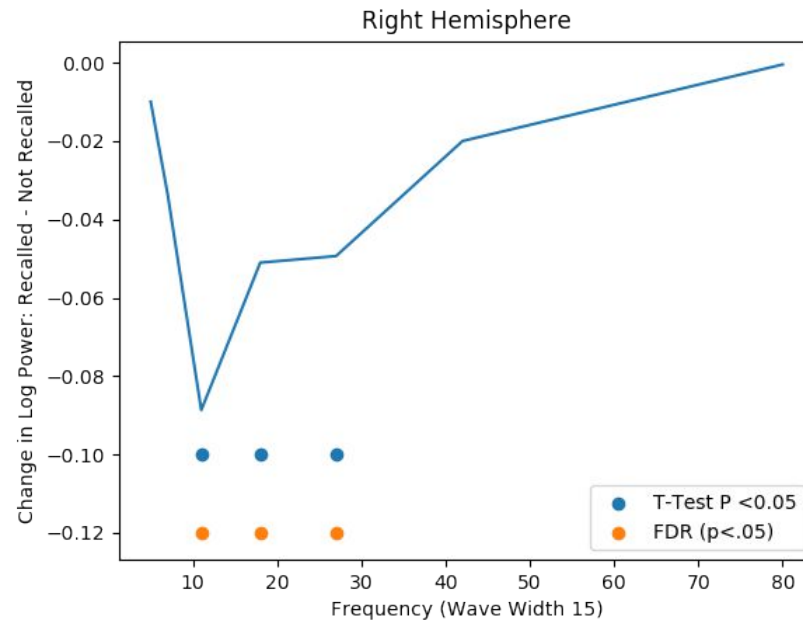
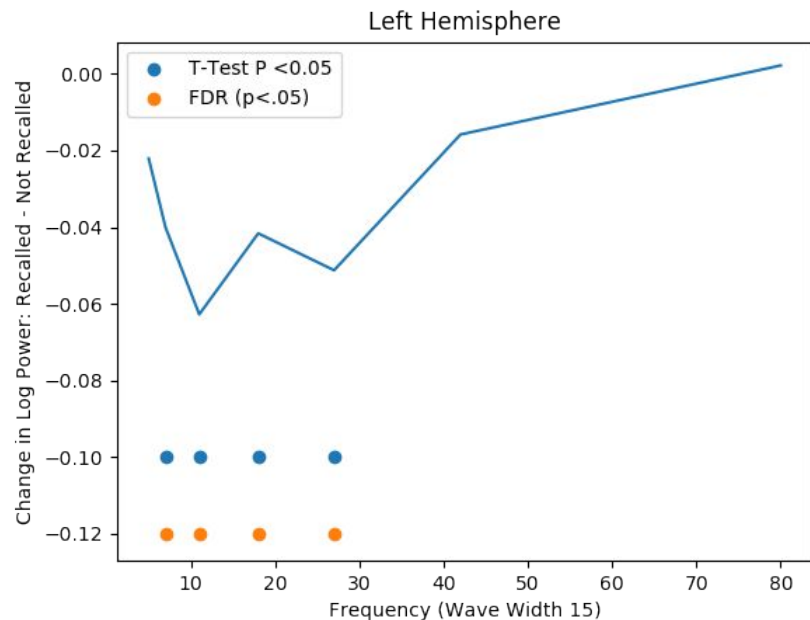
Significant Frequencies: 5, 11, 18, 27 Hz

Wave Width of 2



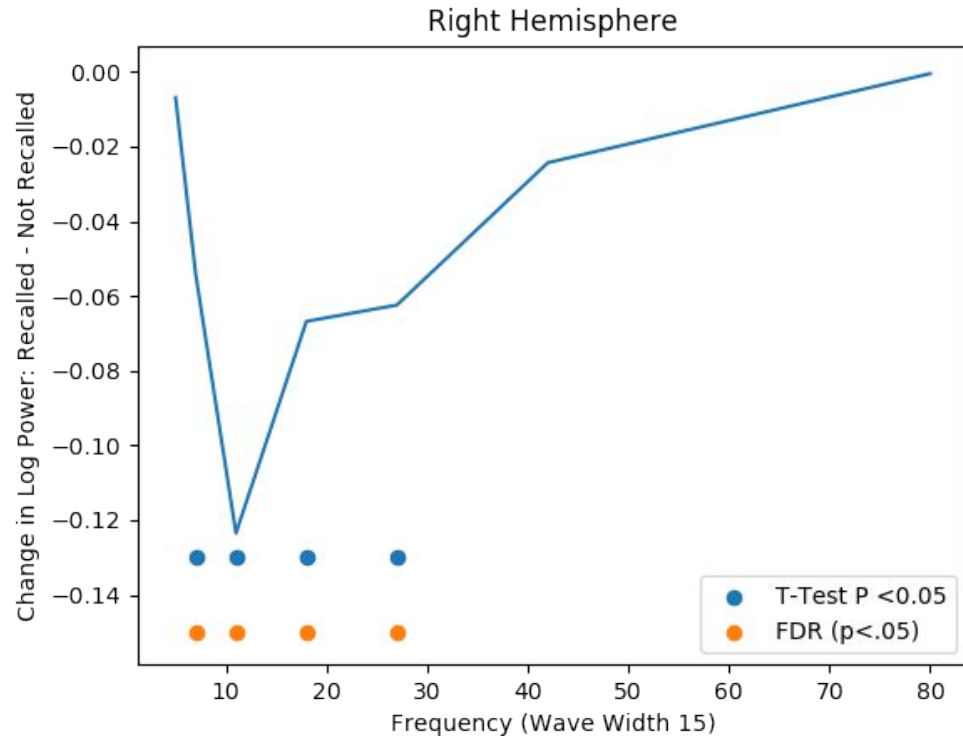
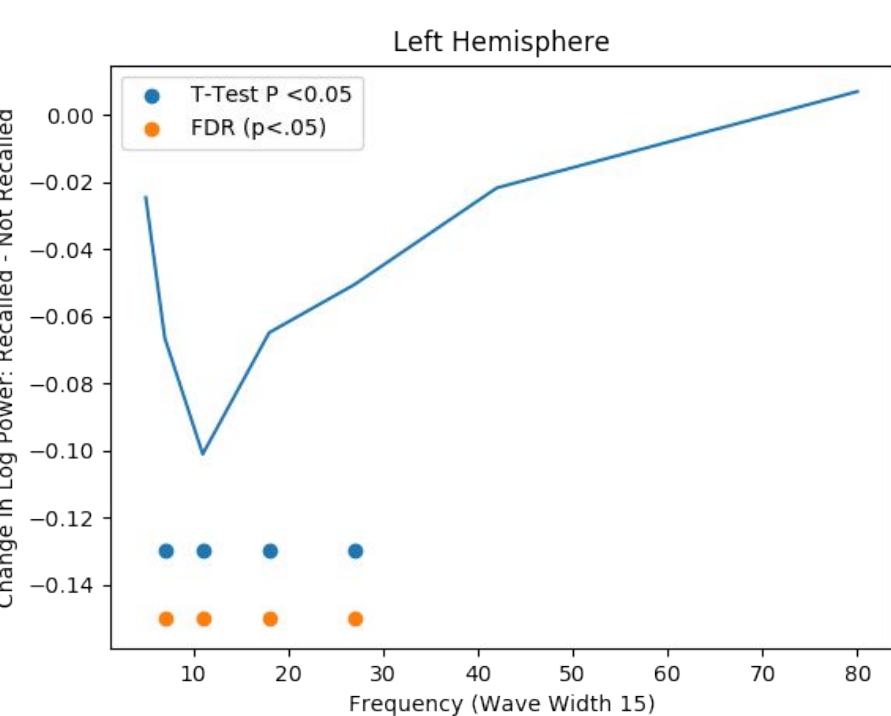
Significant Frequencies: 5, 11, 18, 27, 42 Hz

Wave Width of 15

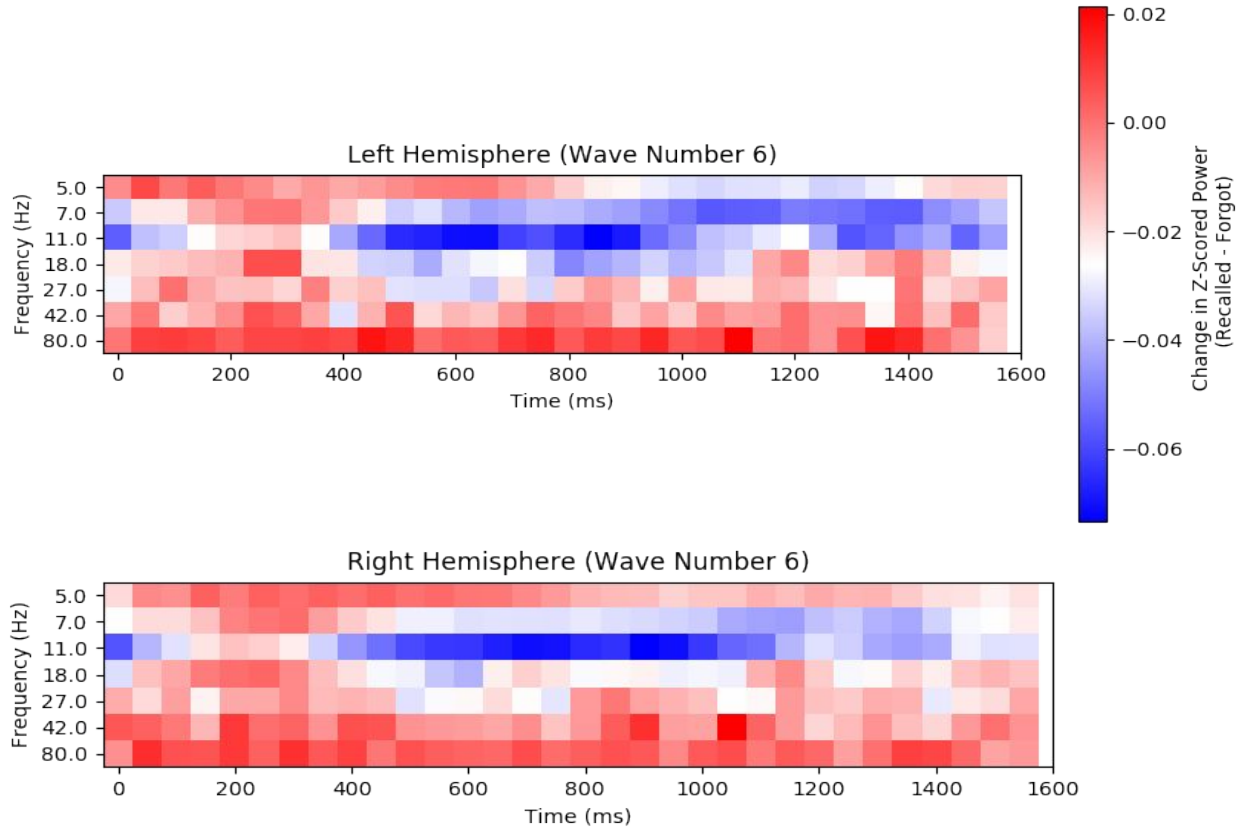


Significant Frequencies: 5, 11, 18 (and 27 for left only) Hz

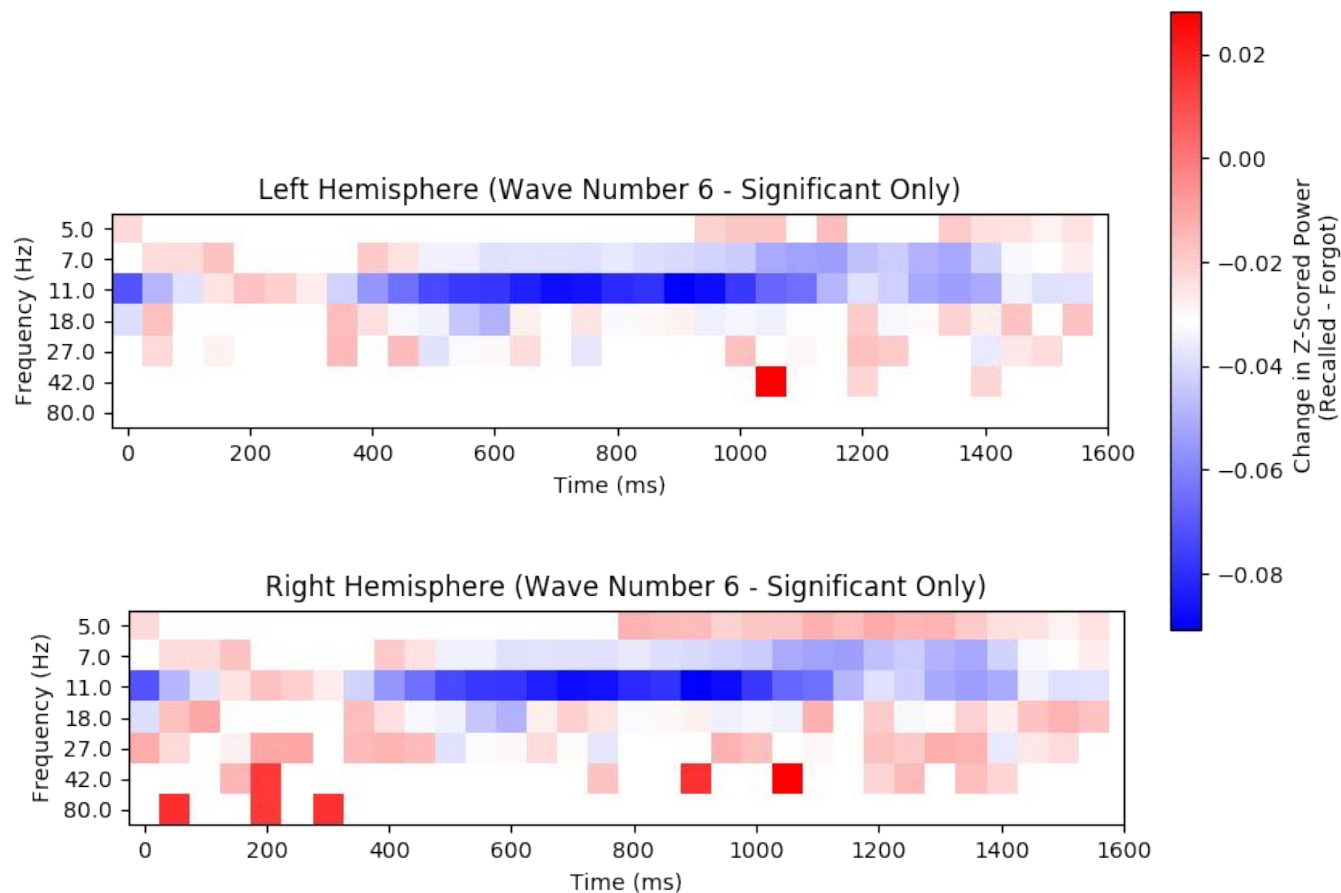
Wave Width of 6; No Buffer



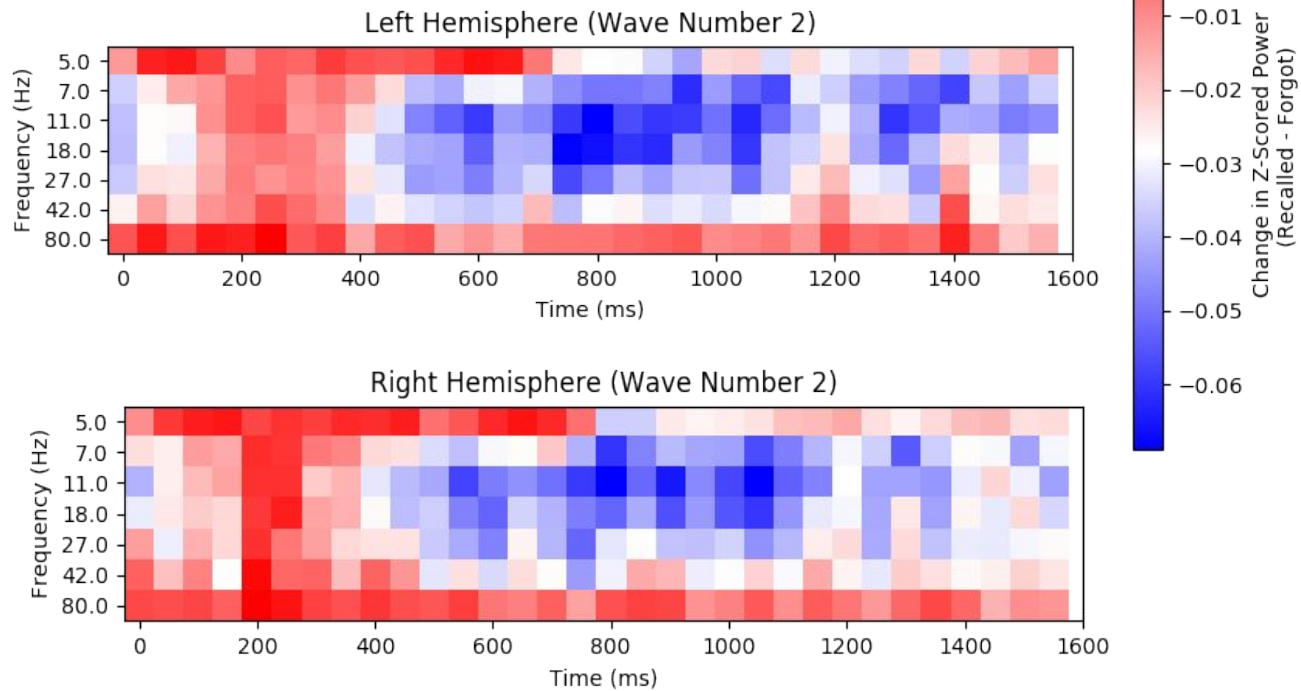
Wave Width of 6



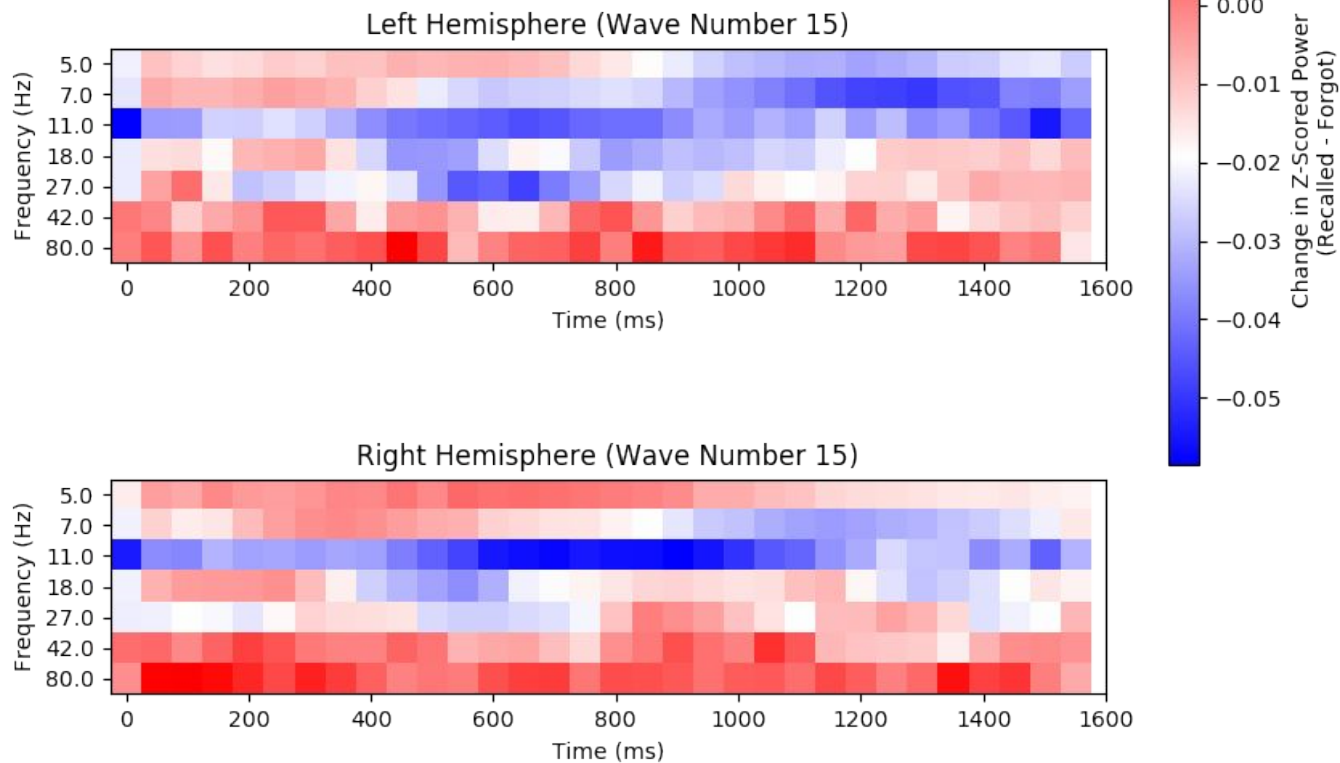
Only Significant Time/Freq Points



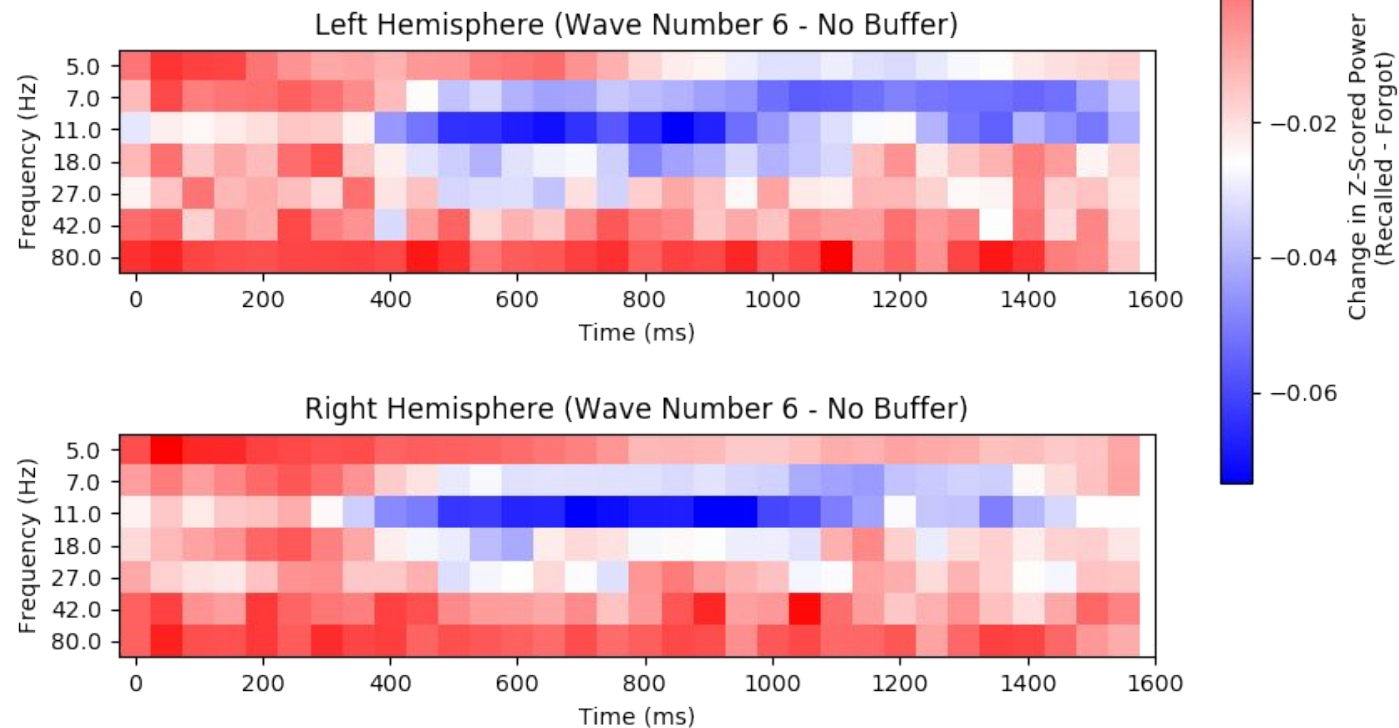
Wave Width 2



Wave Width 15



Wave Width 6; No Buffer



Comments:

Changing the Wave Number changes the tradeoff between frequency and time resolution. With a higher wave number we get higher resolution in the frequency domain and lower resolution in the time domain. The graphs recorded show this, as the part 1 graphs with higher wave numbers have higher resolution, but the graphs in part 2 with higher wave numbers have lower resolution.

Removing the buffer did not have that much of an effect, however it did help remove some of the artificial edge effects that happen during convolution in the wavelet wave transform for edge values that don't have enough time point before/after them.

There seems to be maximal SME from around 400-1100 ms after word stimulus onset. This can be seen in the graphs from part 2 (not including the one with wave width 15 which has bad temporal resolution). The maximal effect seems to be at medium-low frequencies (5-30 Hz), as can be seen from both the graphs in part 1 and the graphs in part 2. The direction of the SME seems to be in the opposite direction as the SME in the time domain. (recalled - not recalled is negative here whereas recalled - not recalled was positive for time series analysis)

Due to how long this code takes to run and due to cluster issues, I did not have time to run the statistical tests for Part 2 for the changes in Part 3.

Assignment Feedback

If we didn't need to do 2 million convolution calculations and it didn't need to take 45 min per set of parameters, it would have been nice to know so before doing the assignment. This assignment took over 10 hours of code runtime, not counting any of the time to write the code!!

The layout of the assignments, first giving the instructions, then the statistics requirement on those instructions, make it hard to write the code. I often write the code after reading the first part without realizing it had to have been structured a certain way in order to extract the correct stats. If all the instructions are presented at once it would be easier to implement the solutions.