

QEEG REPORT

SW-LORETA

NAME OF YOUR CLINIC

By newEpoc LLC



PATIENT BACKGROUND

Presenting Symptoms & History

Patient presents anxious tendencies, particularly related to personal safety or that of their loved ones. Patient reports ruminating and regularly imagining worst case scenarios. Patient notes obsessive-compulsive tendencies that often relate to their rumination.

Patient grinds their teeth at night and often catches themselves clicking their teeth together or tapping their fingers at regular intervals.

Patient reports occasional sleep problems, particularly with falling asleep due to an active mind and ruminations.

Lastly, patient notes frustration with their vocab recall. Patient will forget particular words or phrases that, at other times, come easily to them.

Training Goals

Reduce anxiety, reduce OCD tendencies, improve sleep, and increase vocab recall.

The networks and regions listed below were selected for the patient’s protocol to best target their training goals. The locations were chosen by a combination of the patient’s reported symptoms, their clinician’s diagnoses, and observed deviations in the patient’s data.

Symptoms to Train	Medications	Previous Maps & Protocols	
1. Anxiety Network	Only taking daily vitamins: Magnesium – 500 mg Potassium – 99 mg Vitamin B complex Vitamin C – 1,000 mg	Baseline qEEG	9/15/2020
2. Obsessive Thoughts		Protocol 1, EO	9/18/2020
3. Sleep Problems			
4. Language Network			
5. Word Finding Problems			



DATA OBSERVATIONS

QEEG Raw Data

No abnormal wave morphologies were noted in eyes open or eyes closed qEEG datasets. Some sleepiness was noted in both recordings. However, enough artifact-free data was present to produce quality qEEG analysis. Analysis reveals more deviations from normal in the eyes open dataset. Therefore, eyes open data will be inspected in following discussion.

Z-Score Analysis

Current Density Regions

Brodmann areas 1-9, 23, 24, 31, 33, and left 40-44 all tend to deviate from the mean, particularly in the alpha 2 (10-12 Hz) and beta 1 (12-15 Hz) bandwidths.

Connectivity

The highest connectivity deviances are found in alpha 2 and, more prominently, in beta 1 bandwidths.

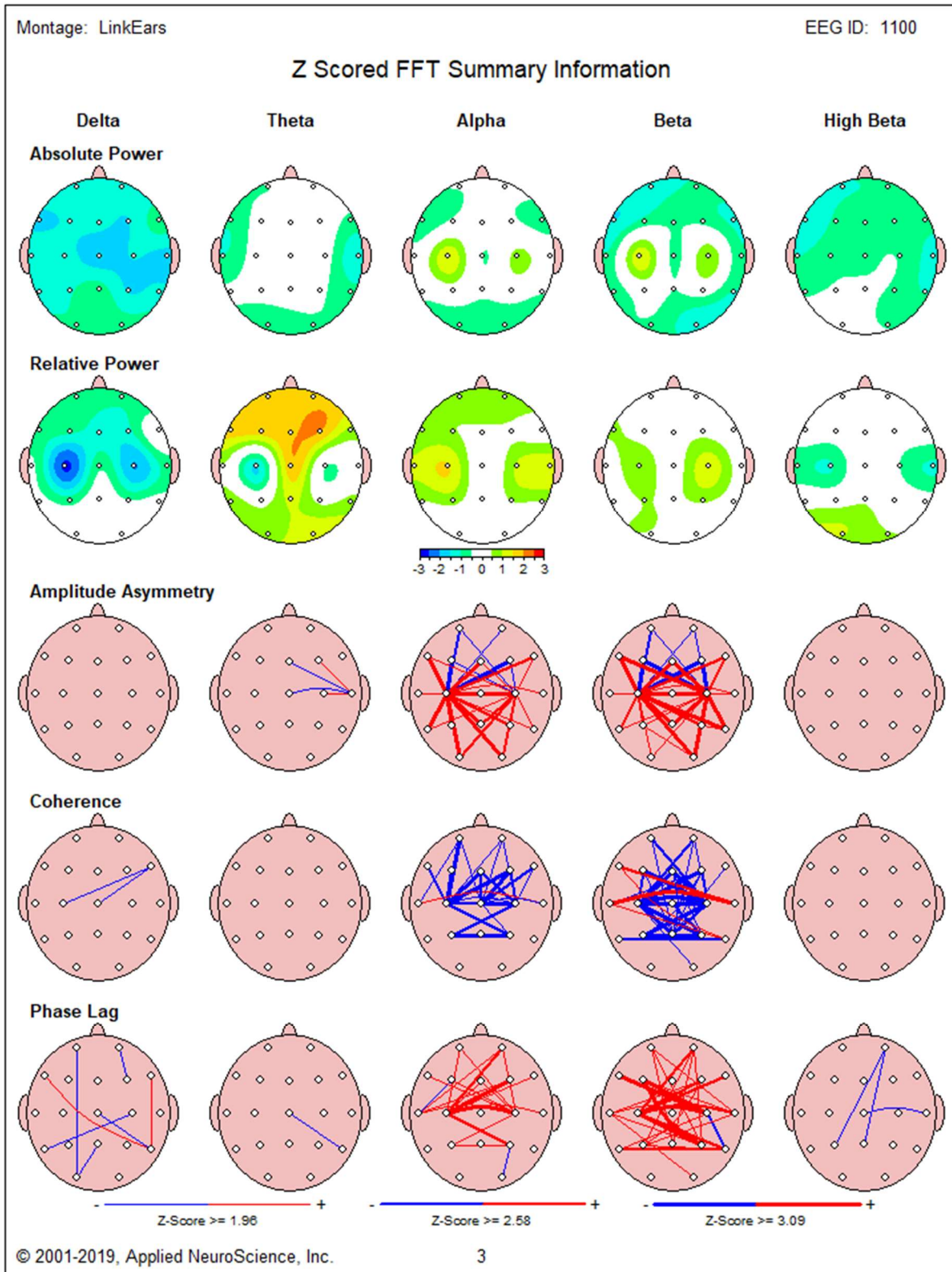
Eye State Selected: Eyes Open

If eyes closed data is shown, it will be specified.

Notes For Reading Data

When comparing the patient's EEG to Thatcher's Quantitative EEG Normative Database: all warm colors (such as red) indicate Z-scores sitting above the mean and all cool colors (such as blue) represent Z-scores resting below the mean. White and gray signify data sitting right at the mean. Connectivity lines not showing also represent data that is sitting at the mean.

LINKED EARS SURFACE

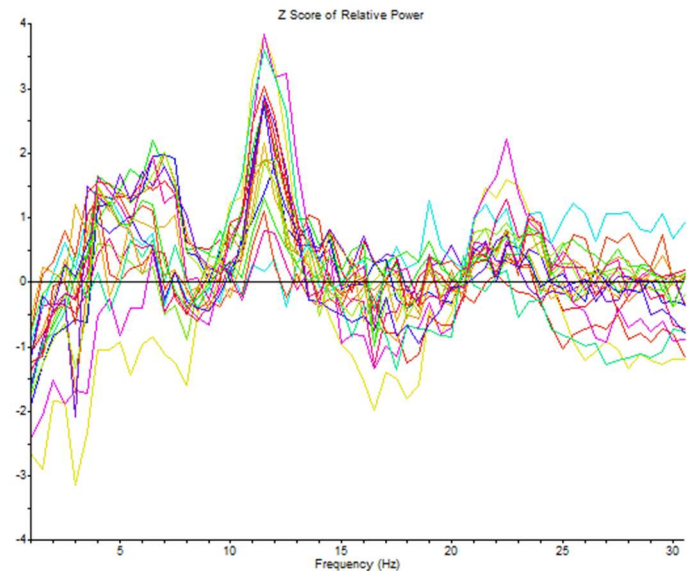
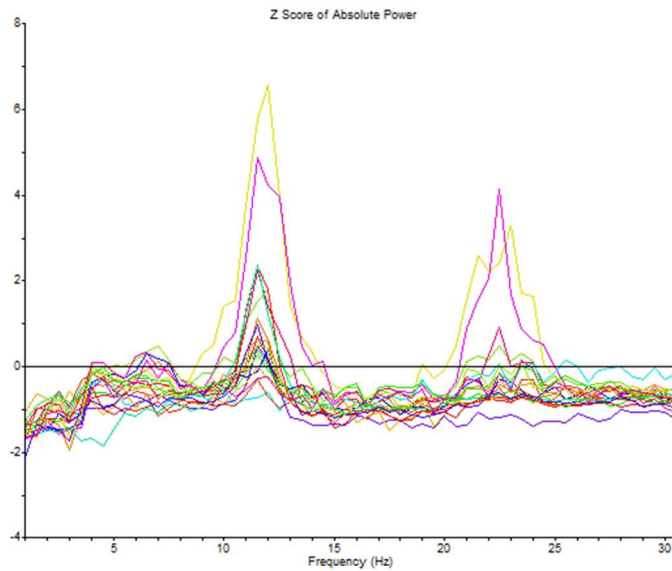
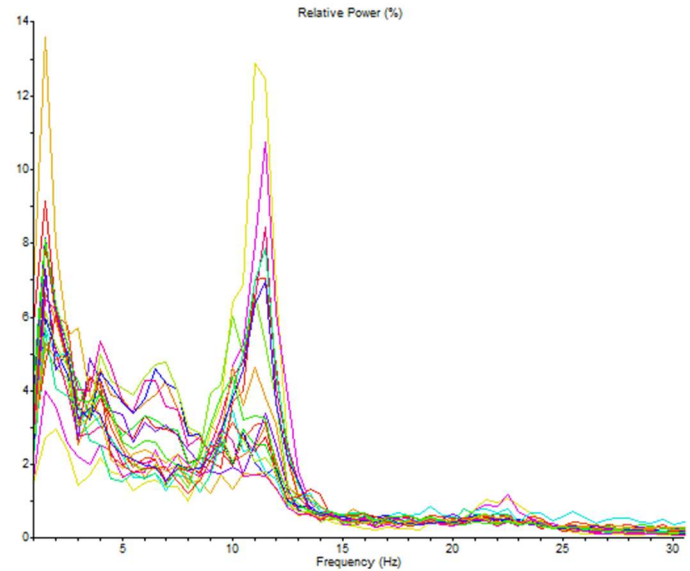
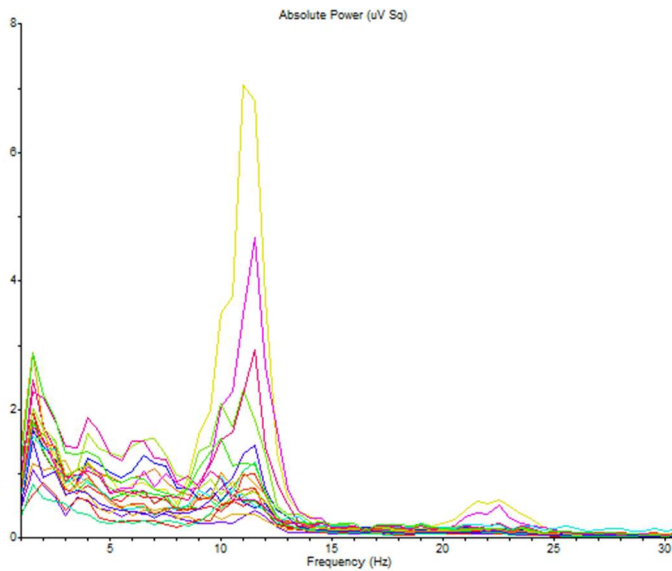


SPECTRALS

Eyes Open

Absolute Power

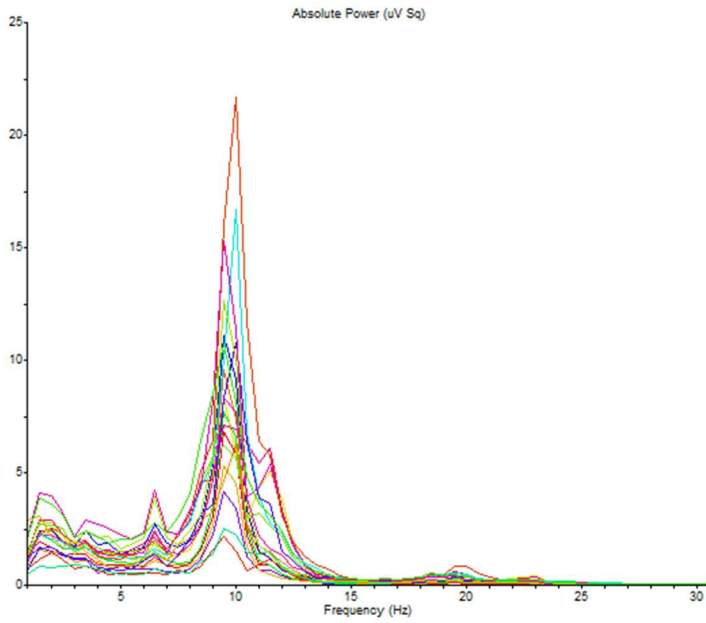
Relative Power



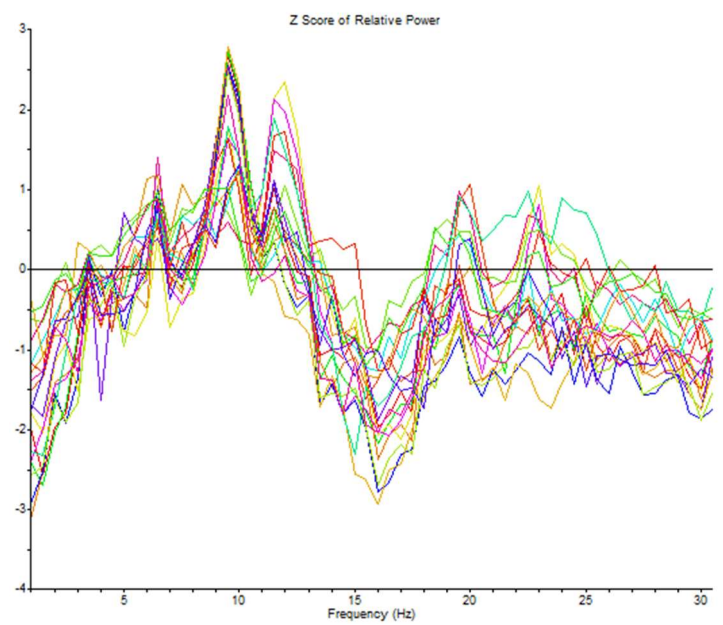
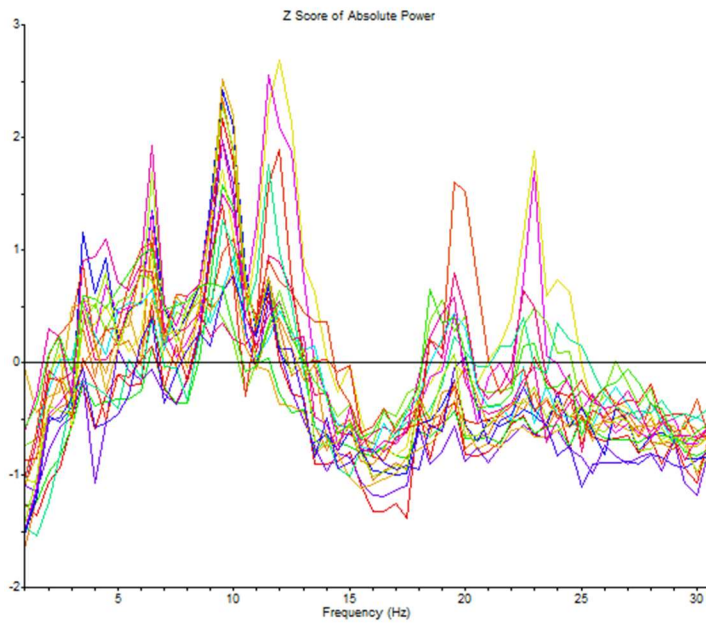
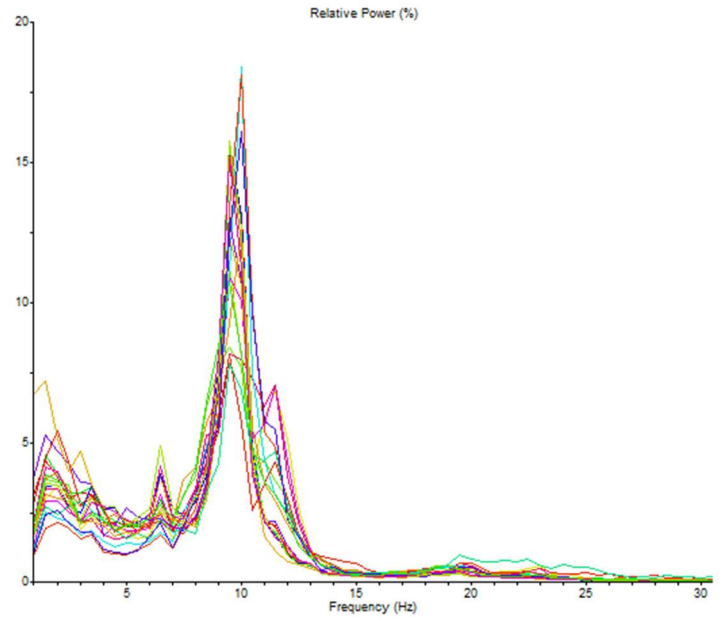
Both absolute and relative power spectrums indicate deviance from the norm most notably between 10-15 Hz. Alpha attenuation is observable in eyes open.

Eyes Closed

Absolute Power



Relative Power



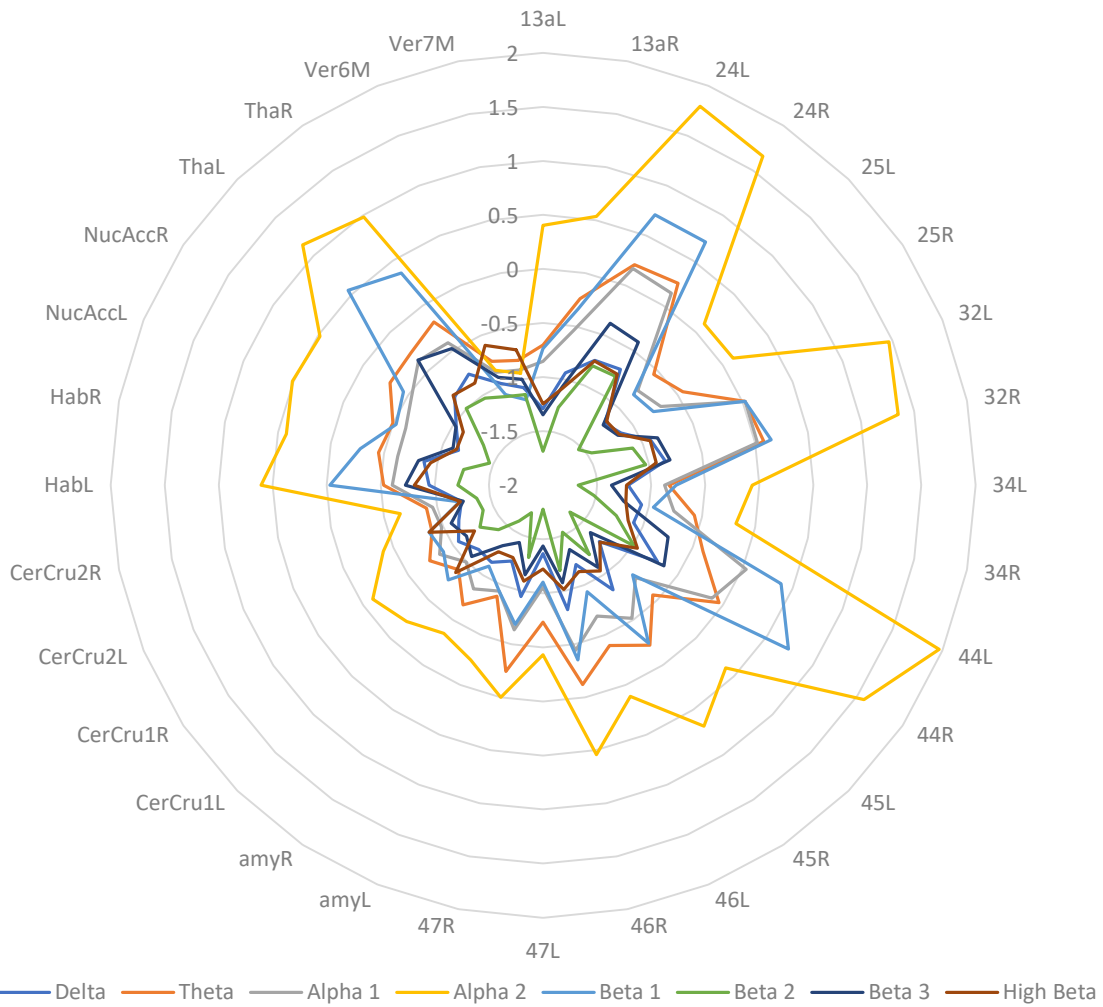
Expected increase in alpha power is present in eyes closed.

NETWORK Z-SCORES CURRENT SOURCE DENSITY

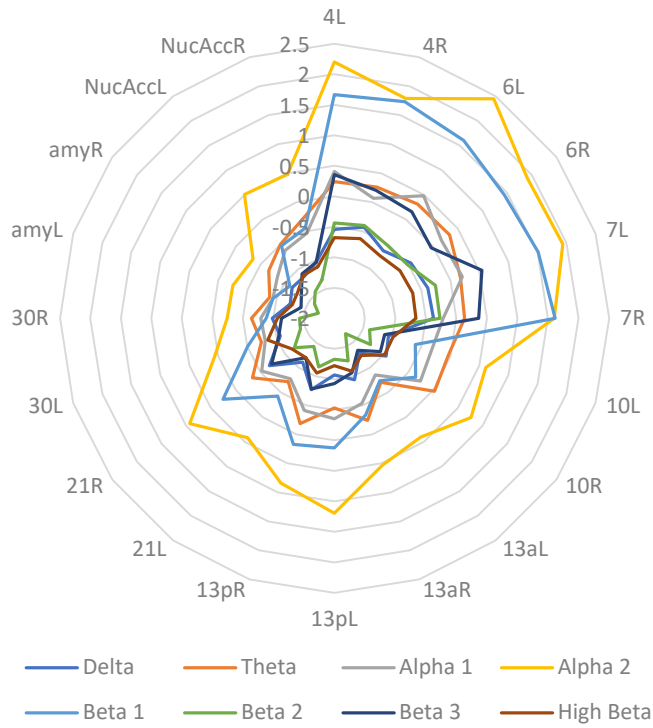
COMMON NETWORKS

Circles = Z-Scores

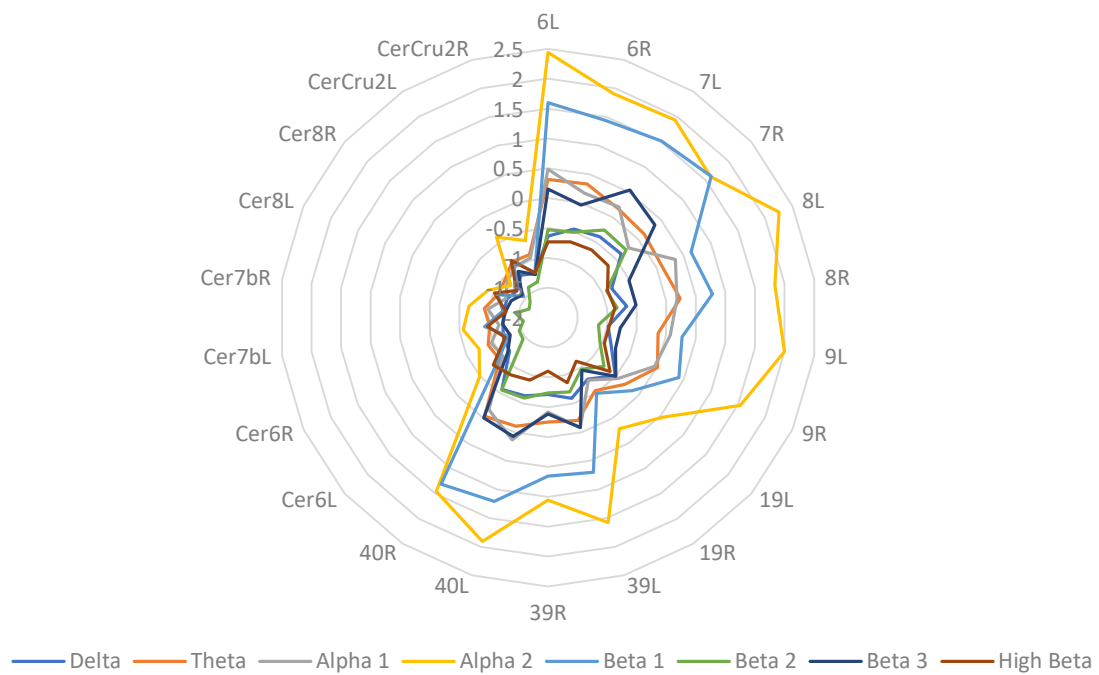
Addiction/Reward Network



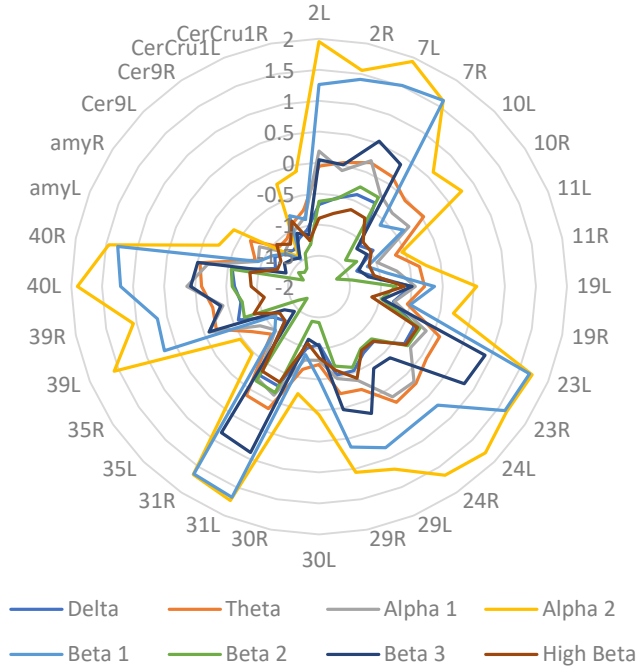
Anxiety Network



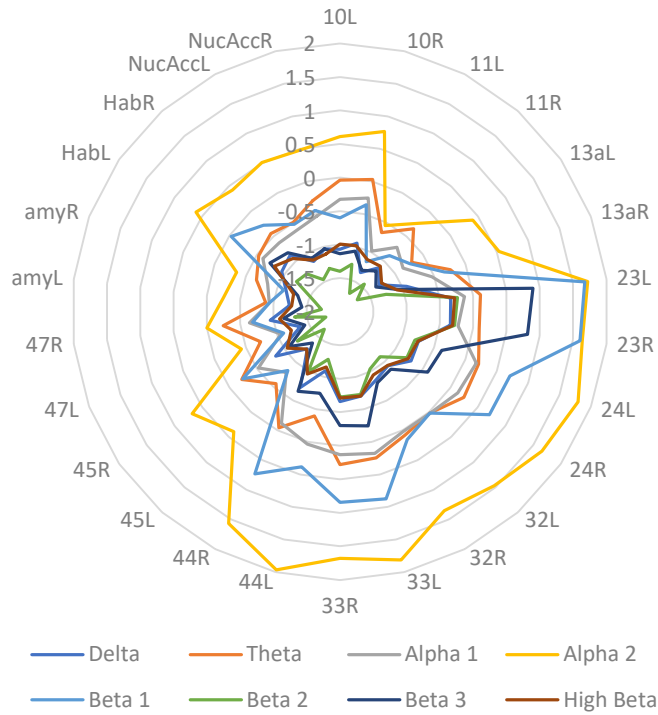
Dorsal Attention Network



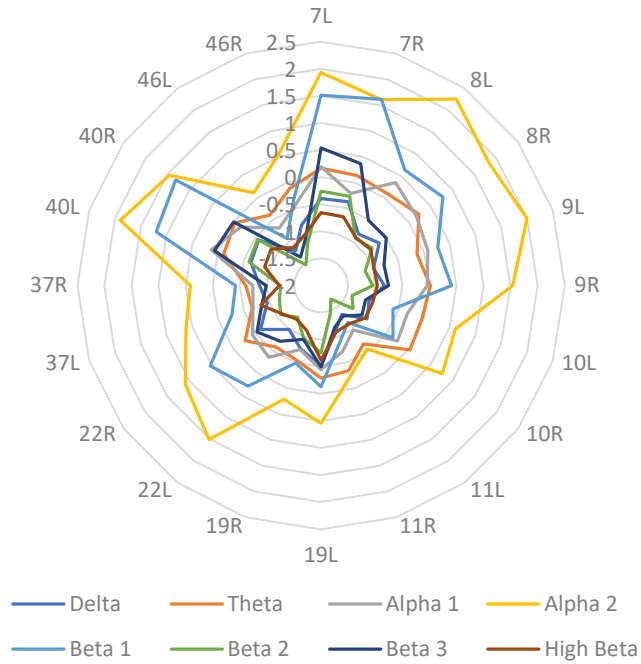
Default Mode Network



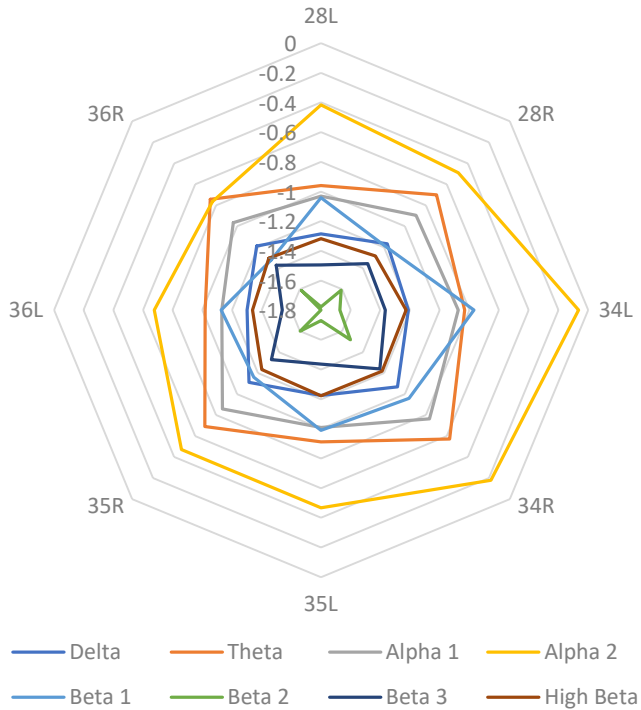
Mood Network



Executive Function Network



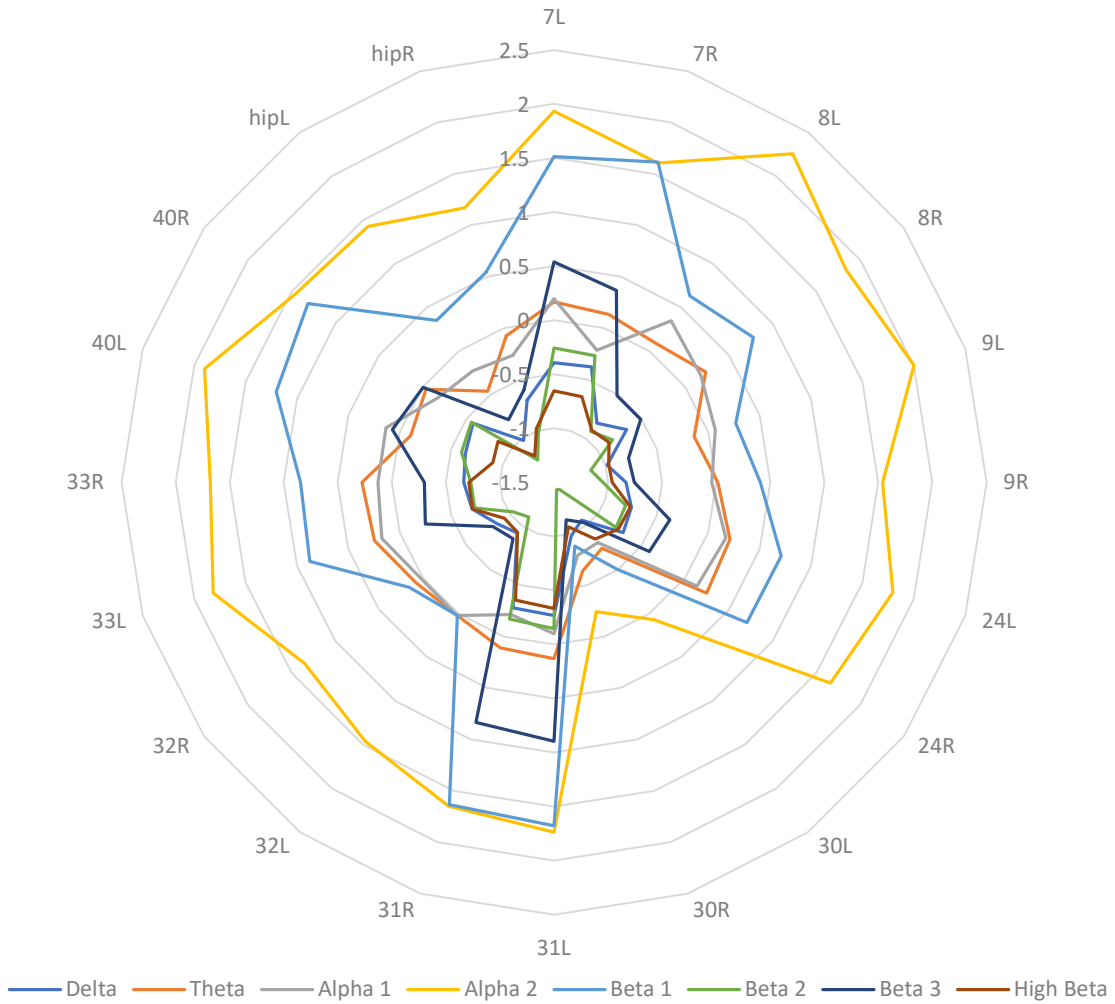
Memory - Emotion Network



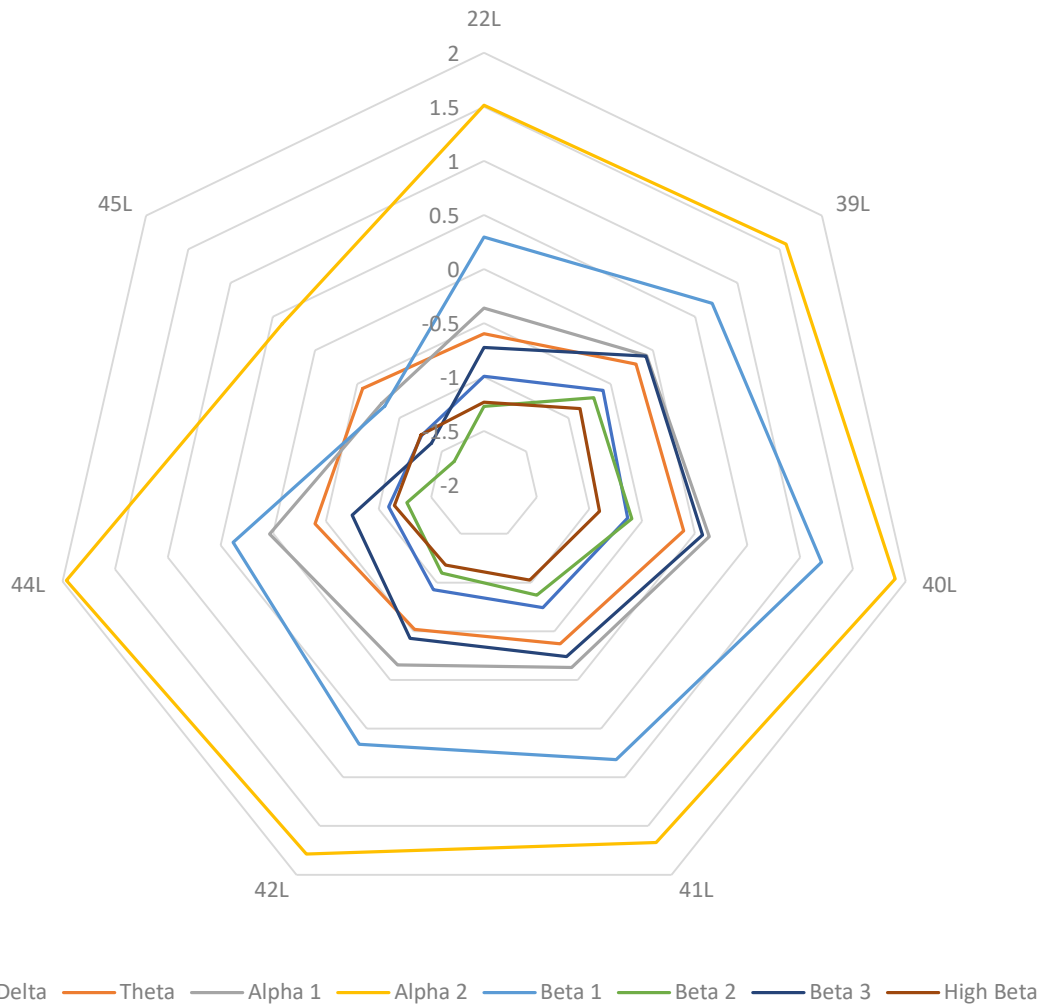
OTHER RELEVANT NETWORKS

Based on Patient Symptoms

Working Memory Network



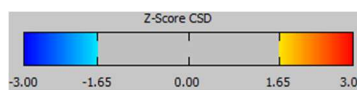
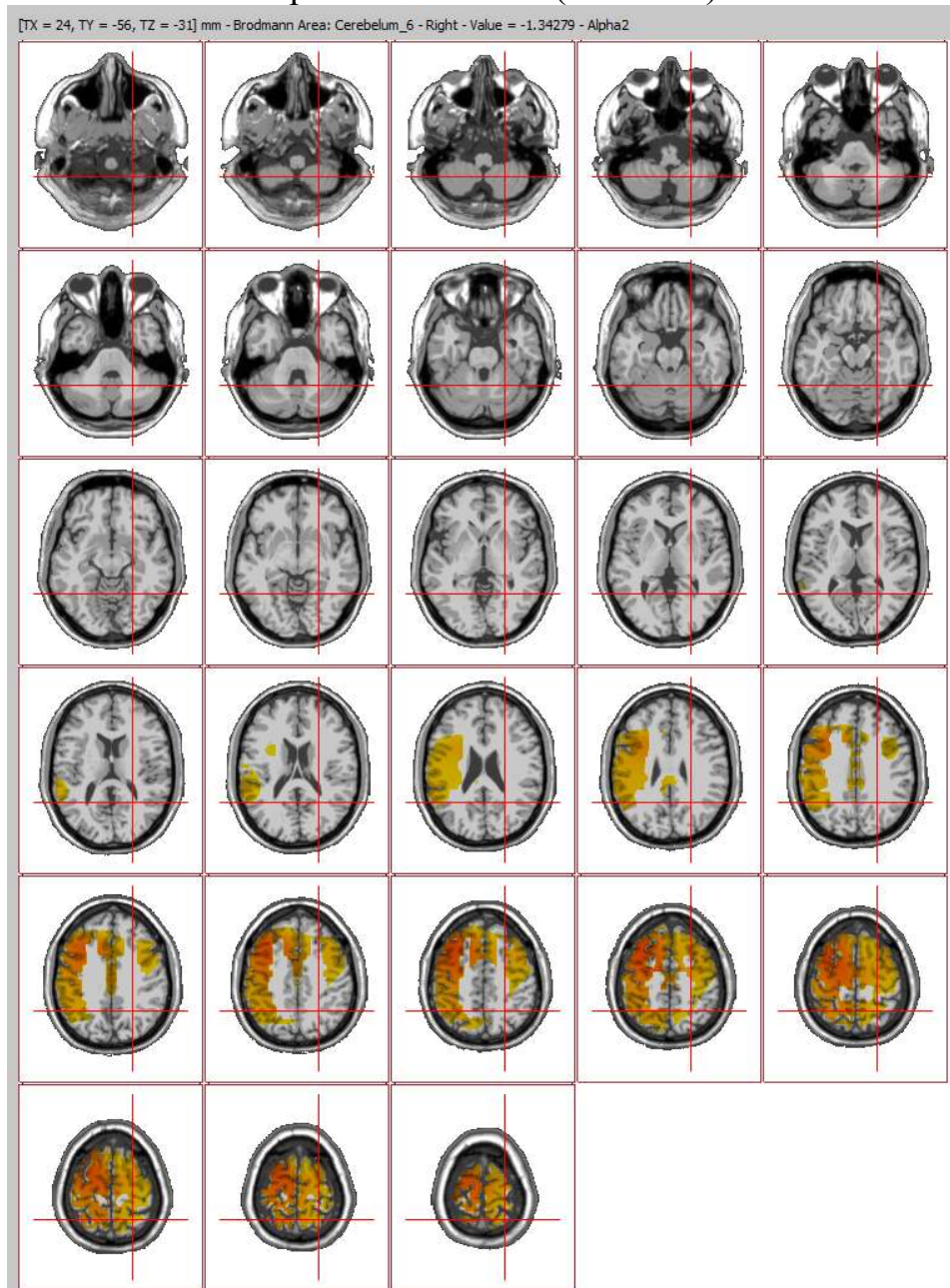
Language Network



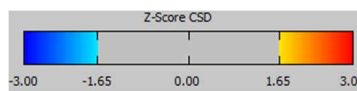
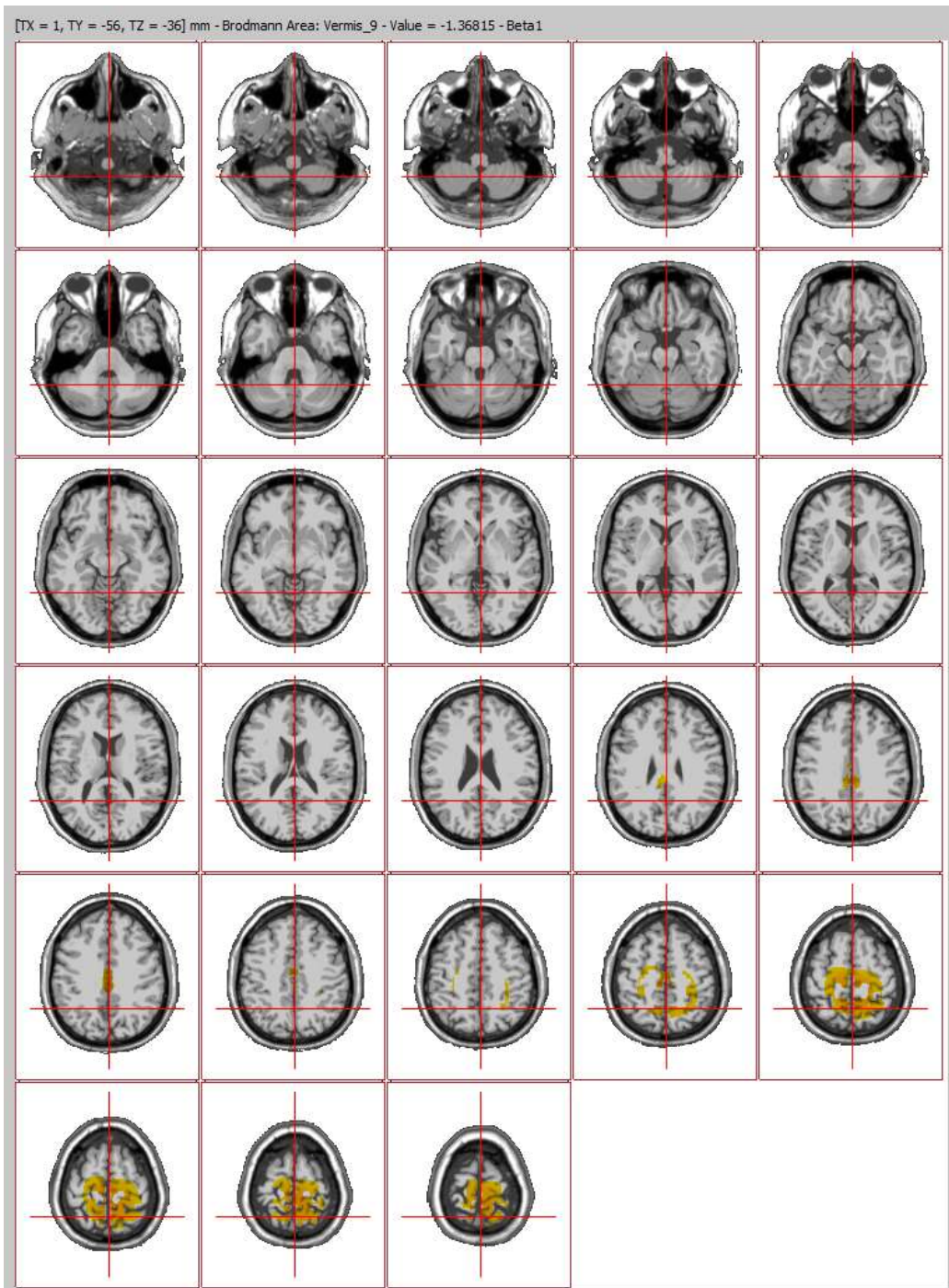
Note: alpha 2 (10-12 Hz) bandwidth is the most notable outlier within the networks shown above. The recommended training protocol focuses on alpha 2 bandwidth primarily, followed by beta 1 (12-15 Hz).

SLICE VIEW CURRENT SOURCE DENSITY

Alpha 2 Bandwidth (10-12 Hz)



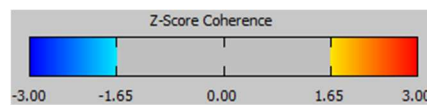
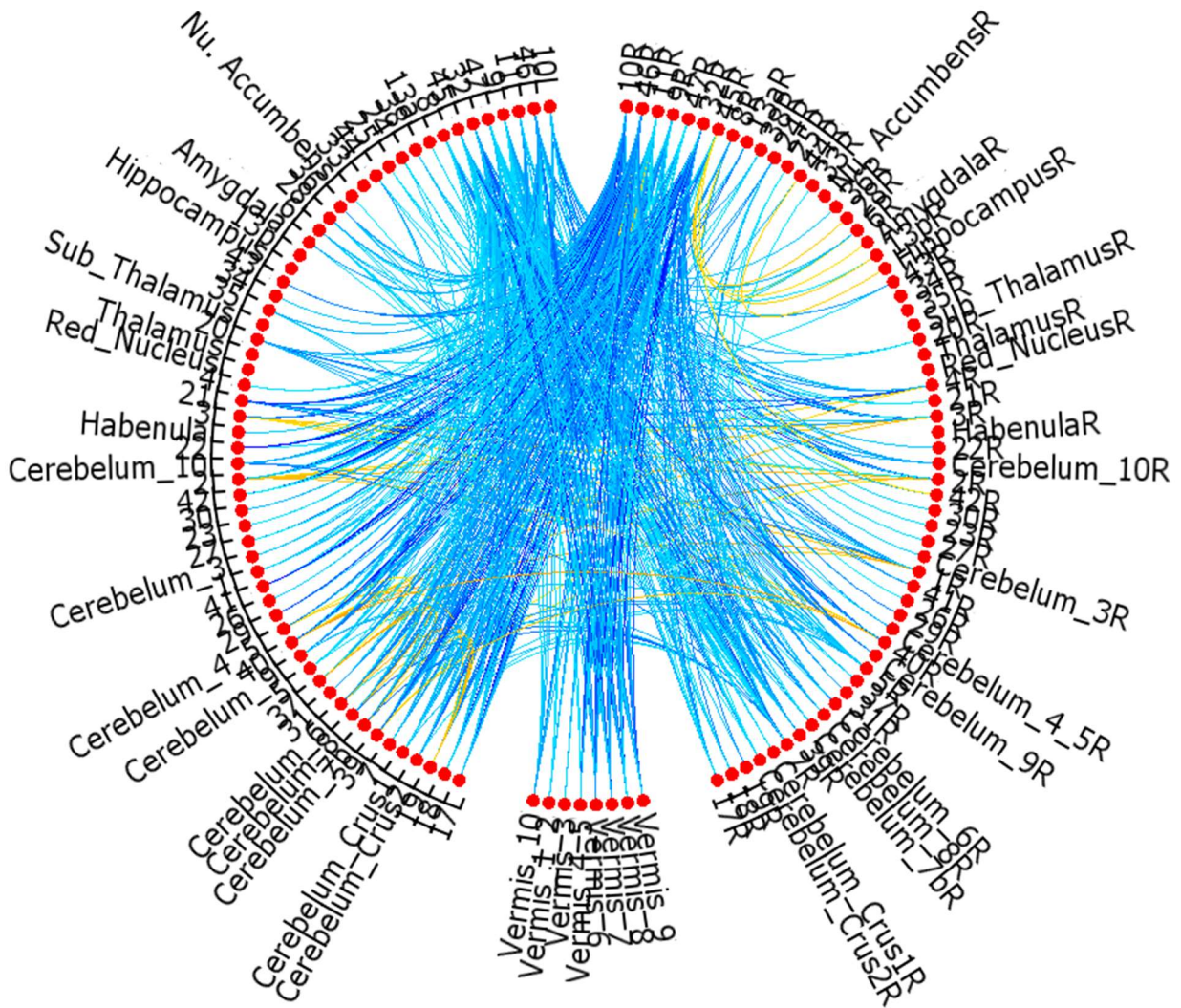
Beta 1 Bandwidth (12-15 Hz)



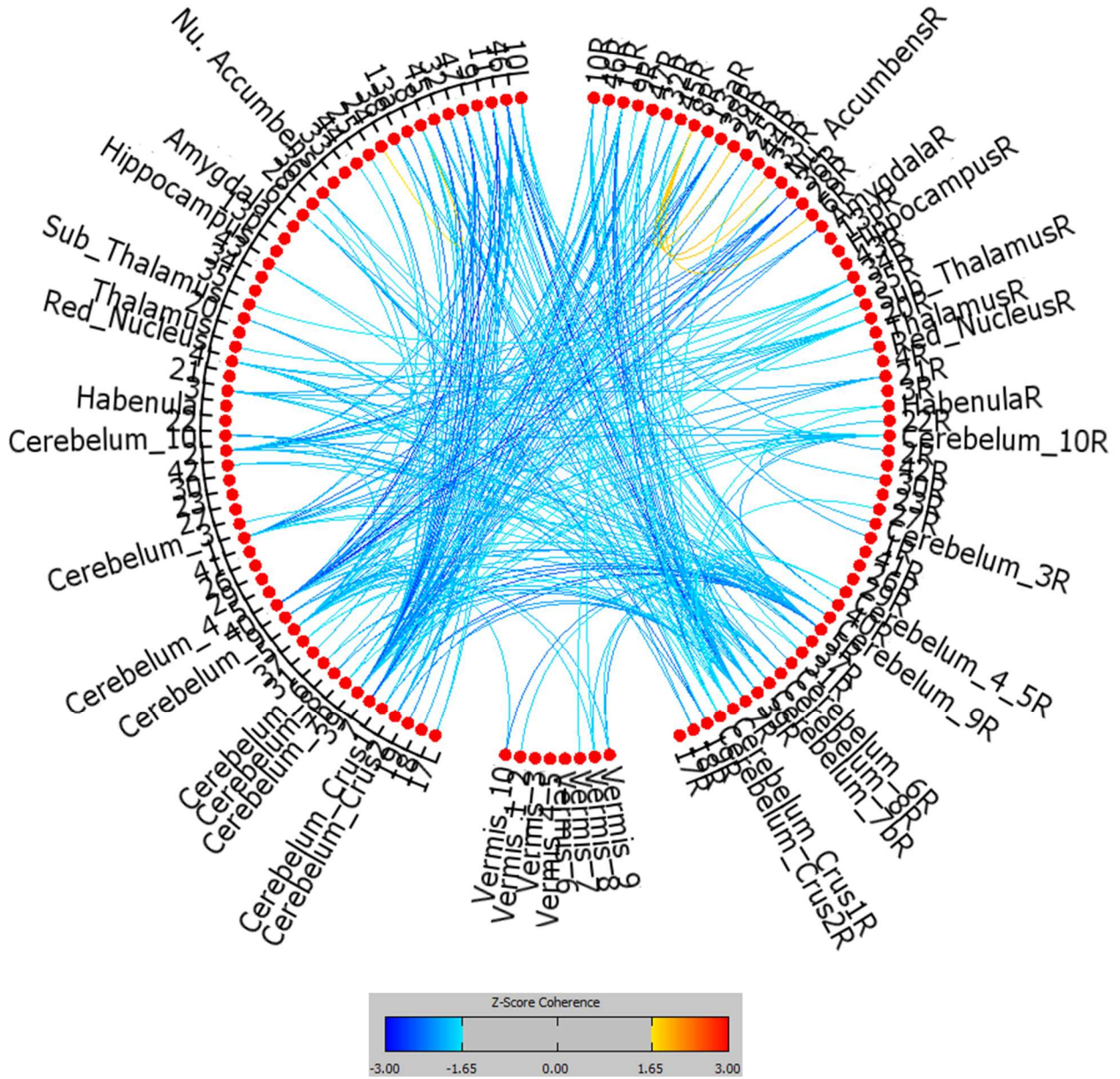
CONNECTOME All Regions

COHERENCE

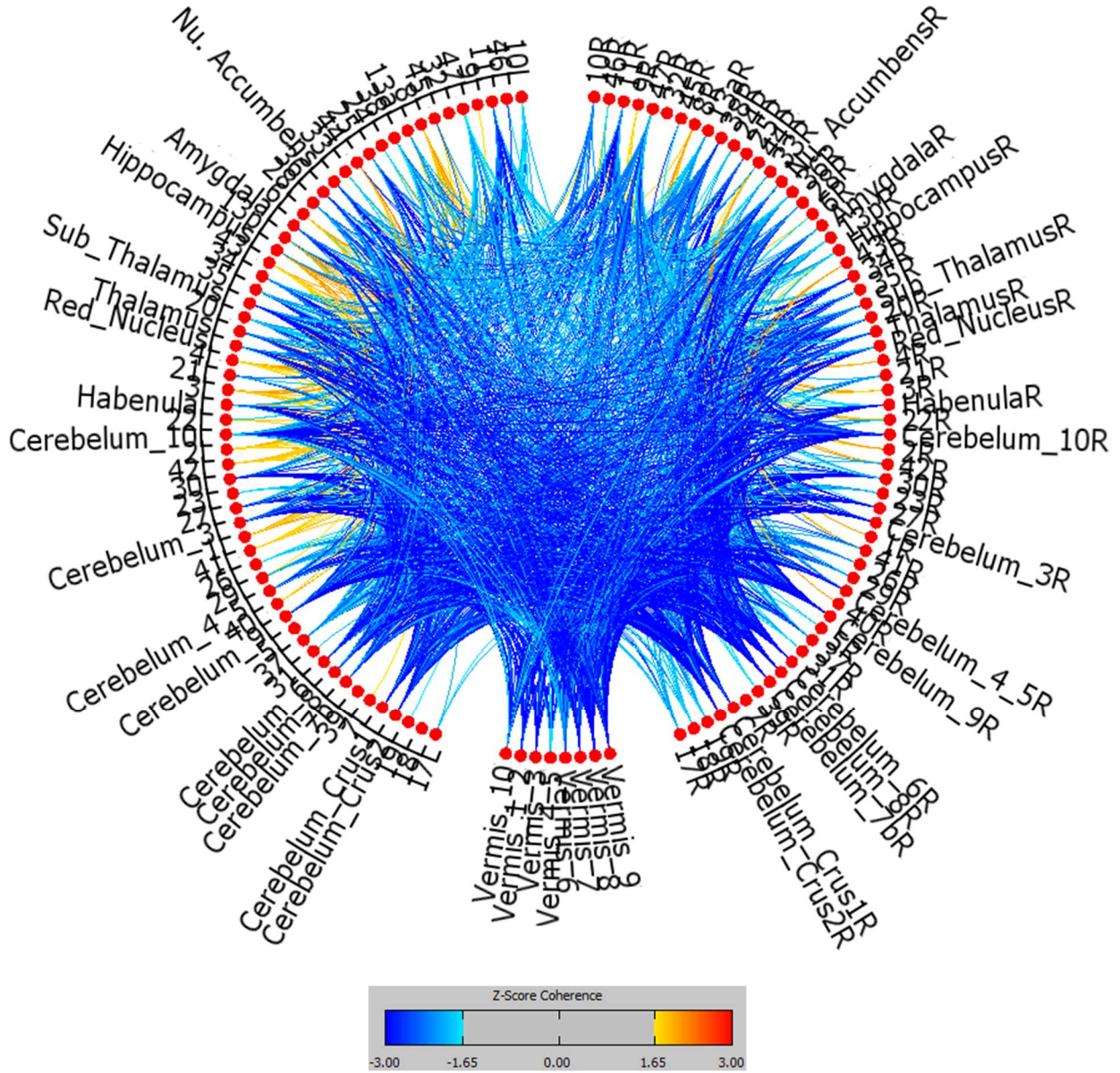
Delta



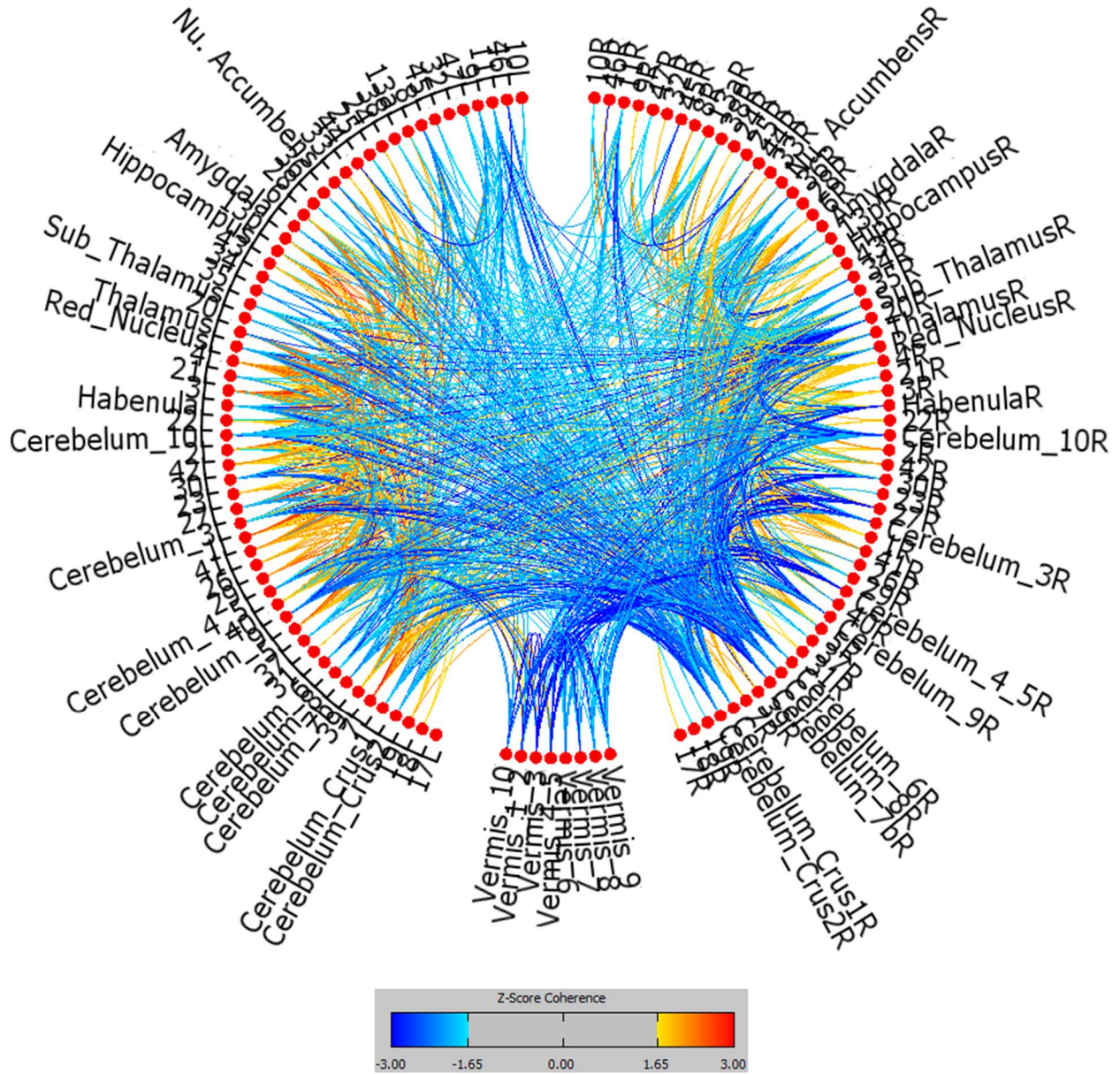
Theta



Alpha

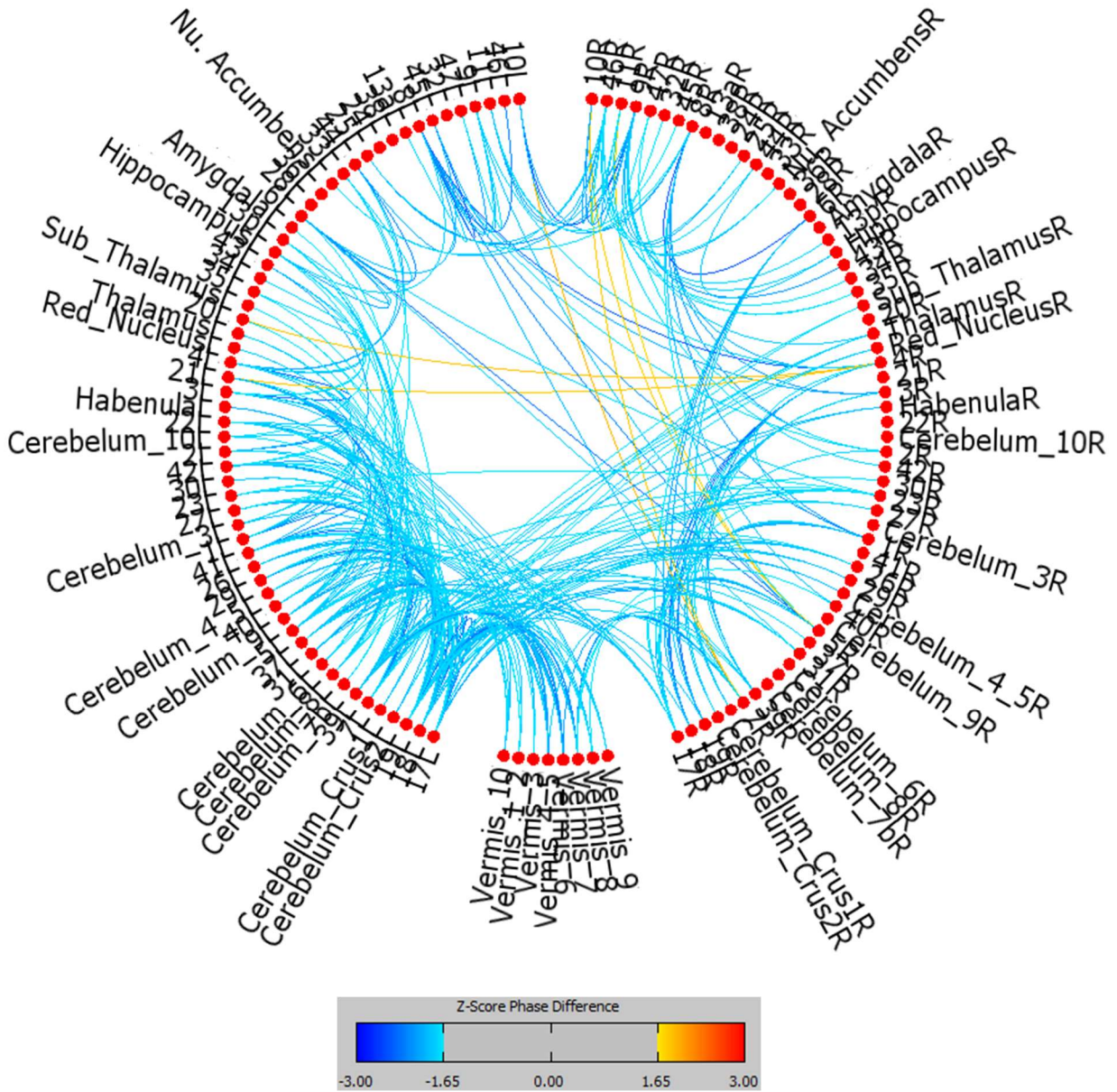


Beta

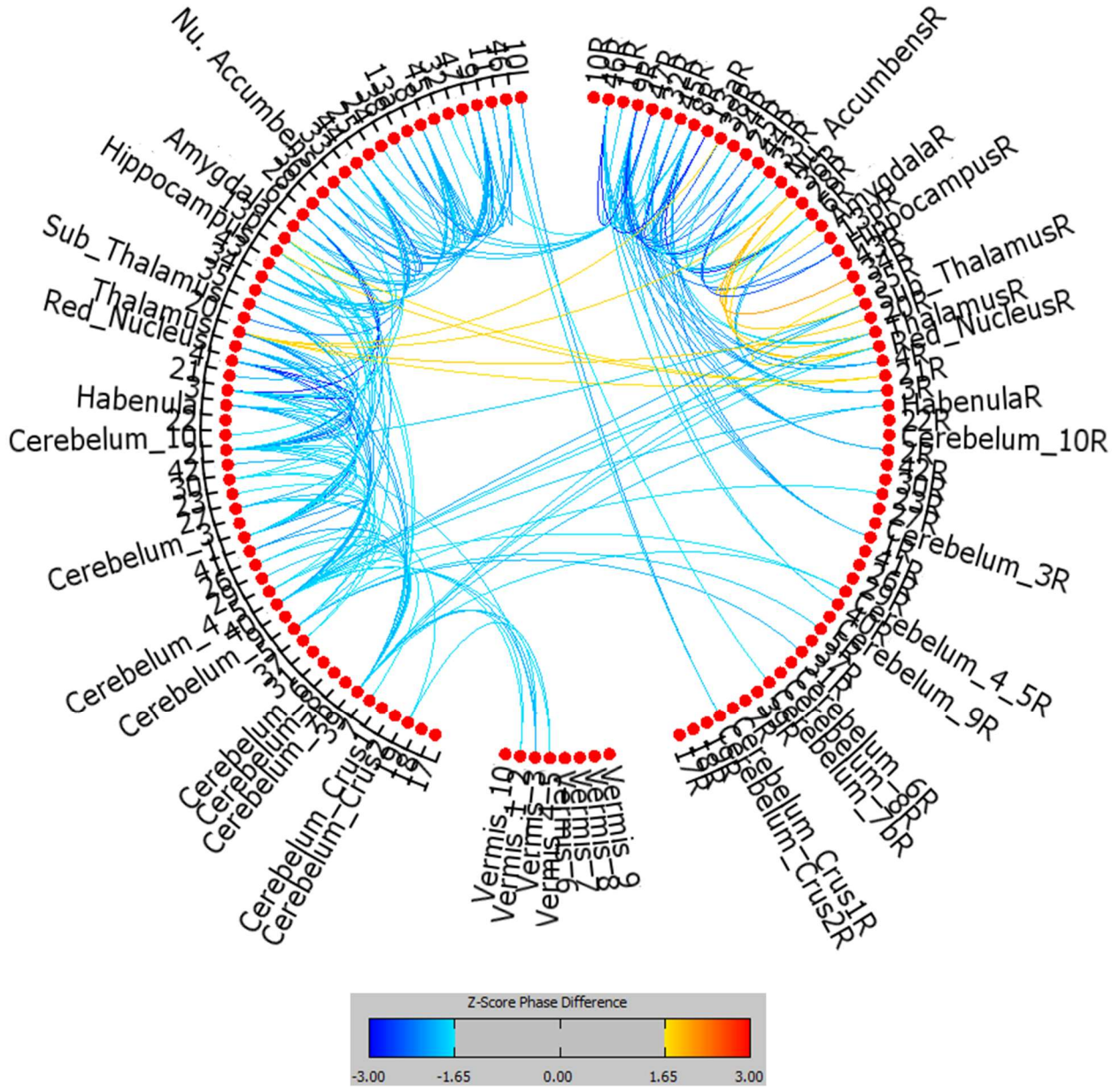


PHASE

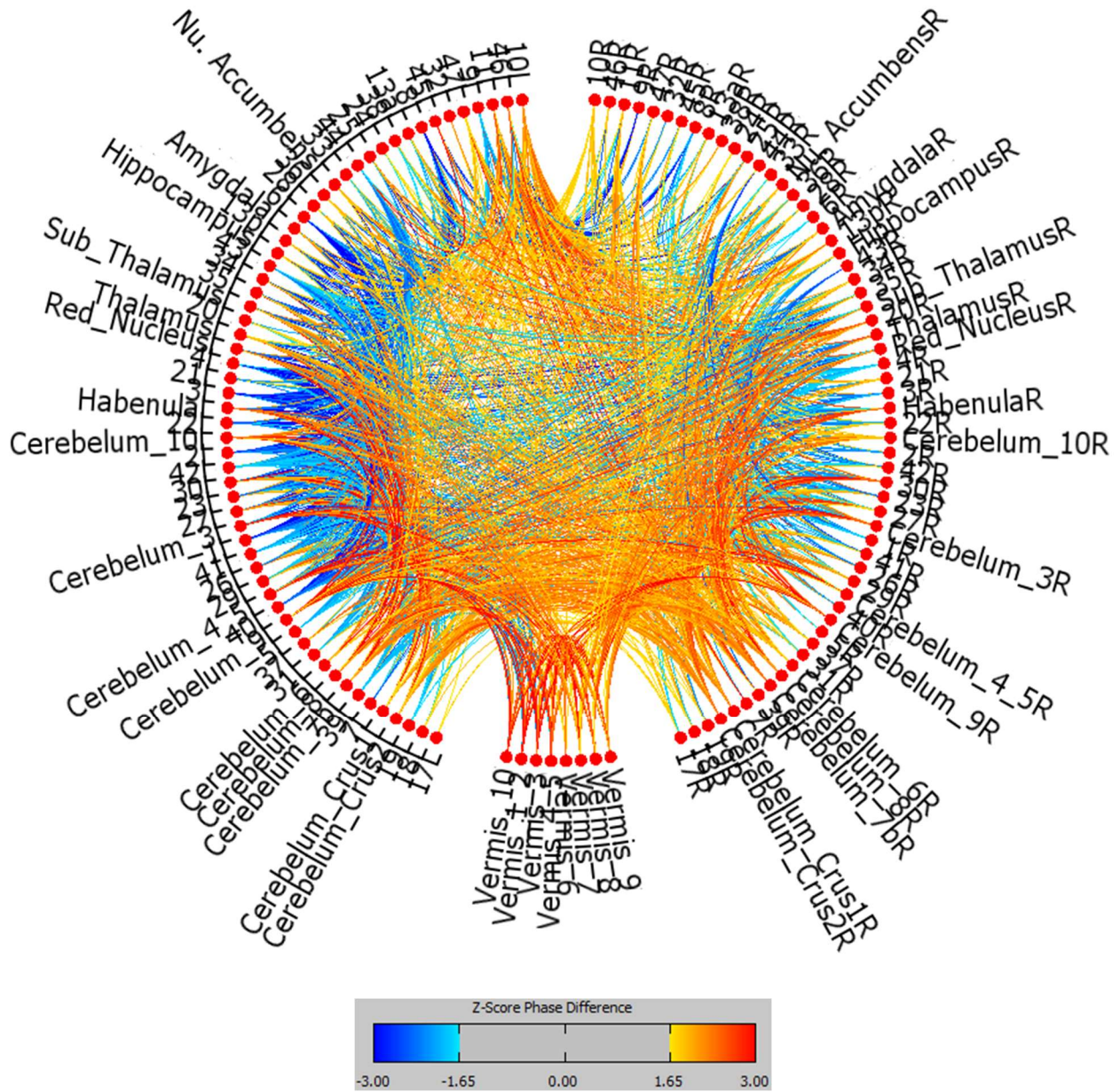
Delta



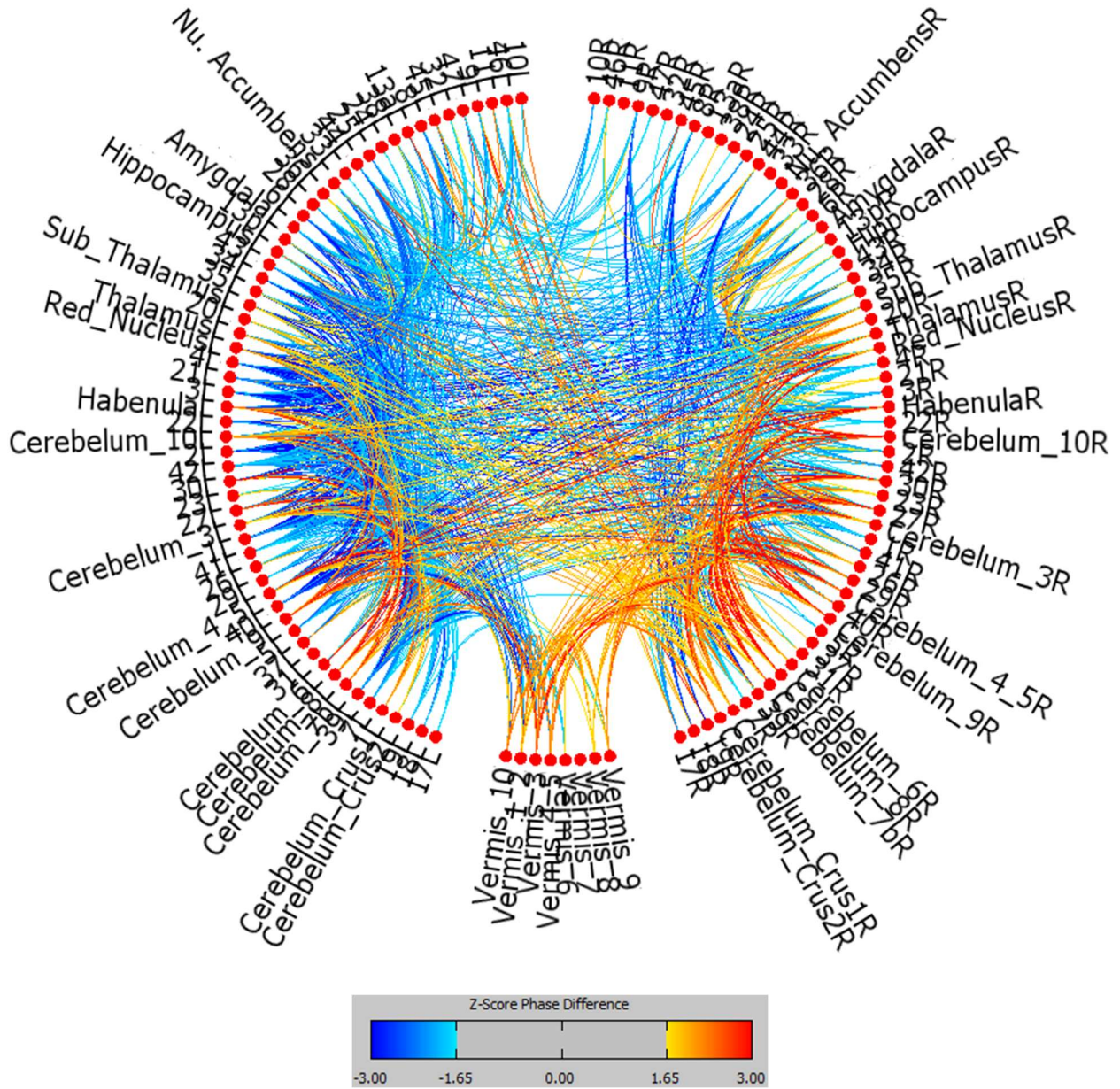
Theta



Alpha



Beta



It is visually observable that alpha and beta bandwidths have the most deviant values in both coherence and phase. The recommended protocol focuses on alpha 2 and beta 1 bandwidths for connectivity training.

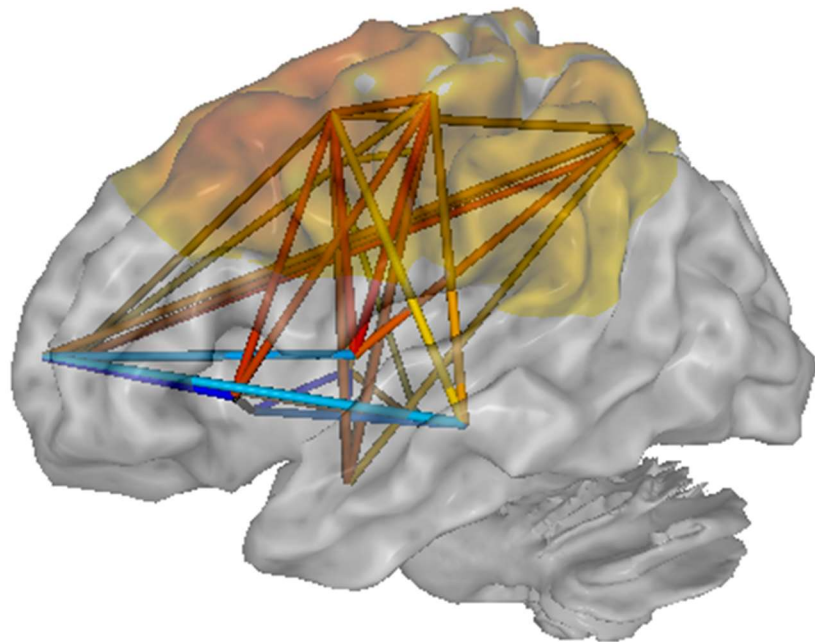
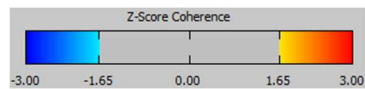
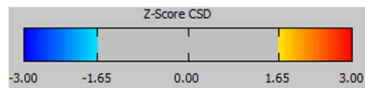
SYMPTOM SPECIFIC

Because we note the highest variances occurring in bandwidths alpha 2 and beta 1, we now assess relevant networks associated to patient symptoms specifically in these bandwidths. This report only shows data for the two highest priority symptoms. However, all symptoms are used in the protocol design.

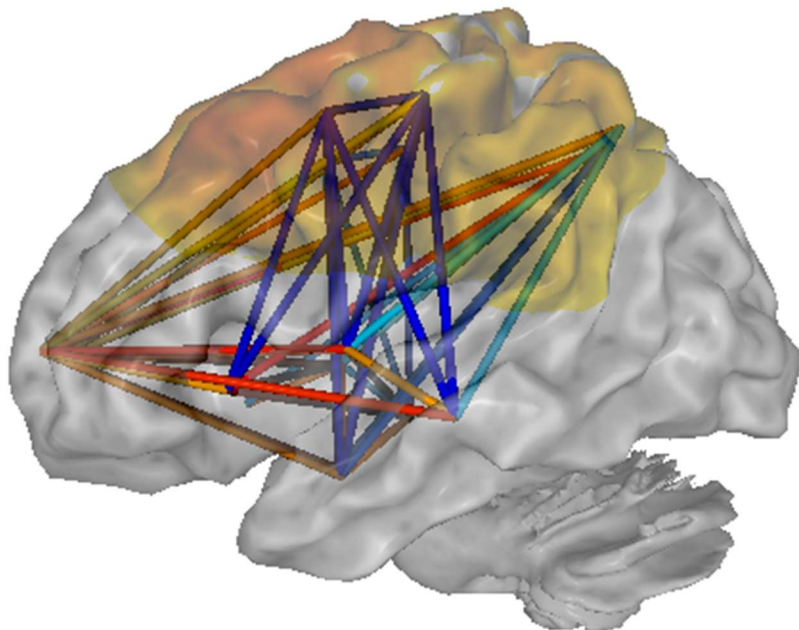
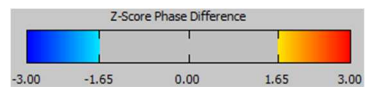
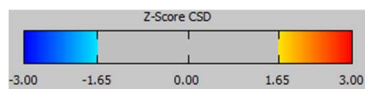
Alpha 2 Bandwidth

Anxiety Network:

Current Density & Coherence

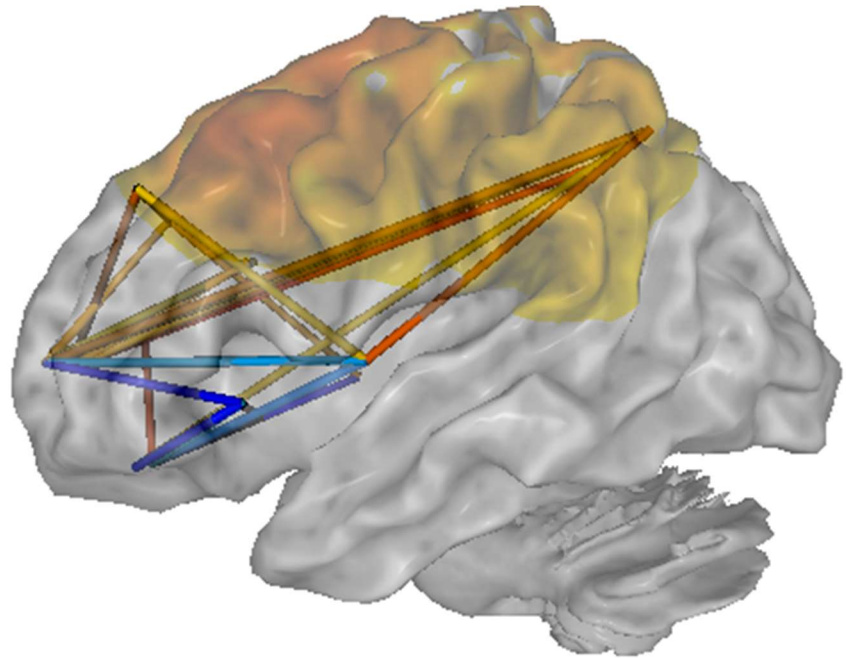
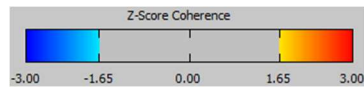
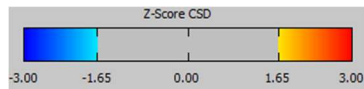


Current Density & Phase

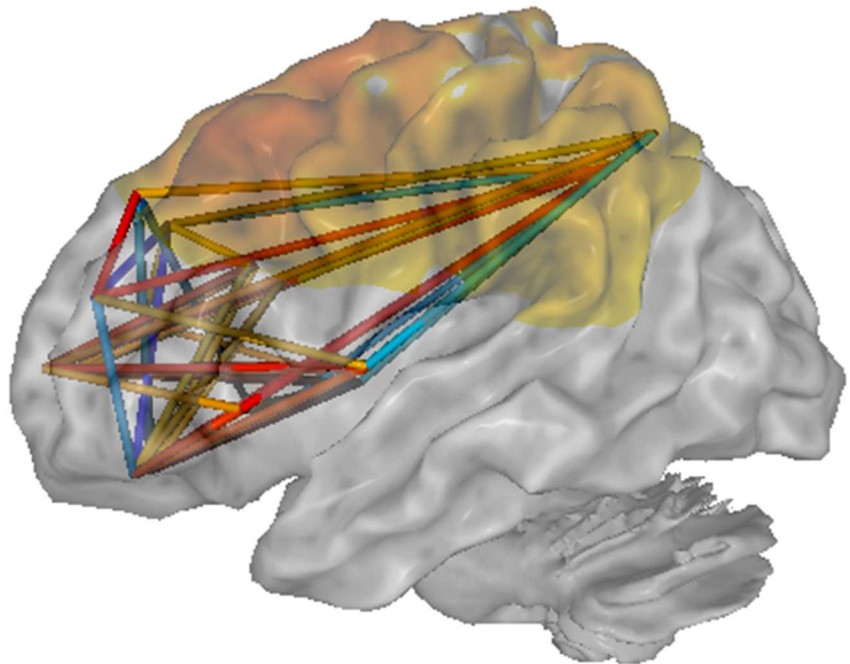
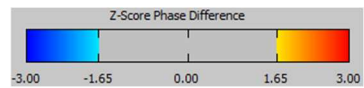
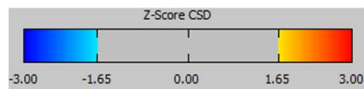


Obsessive Thoughts:

Current Density & Coherence



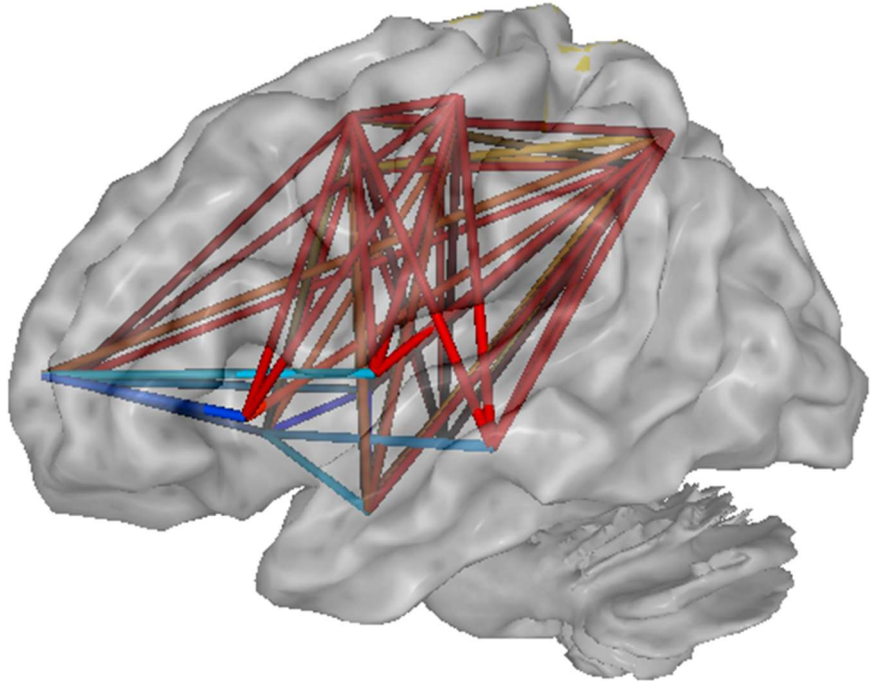
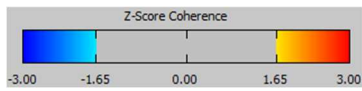
Current Density & Phase



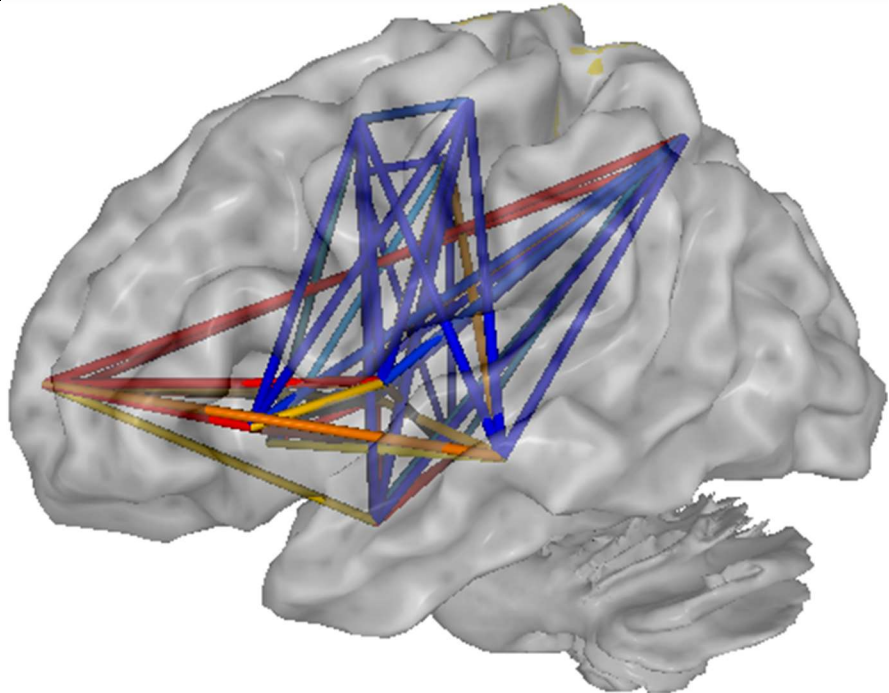
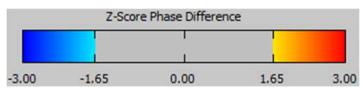
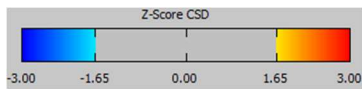
Beta 1 Bandwidth

Anxiety Network:

Current Density & Coherence

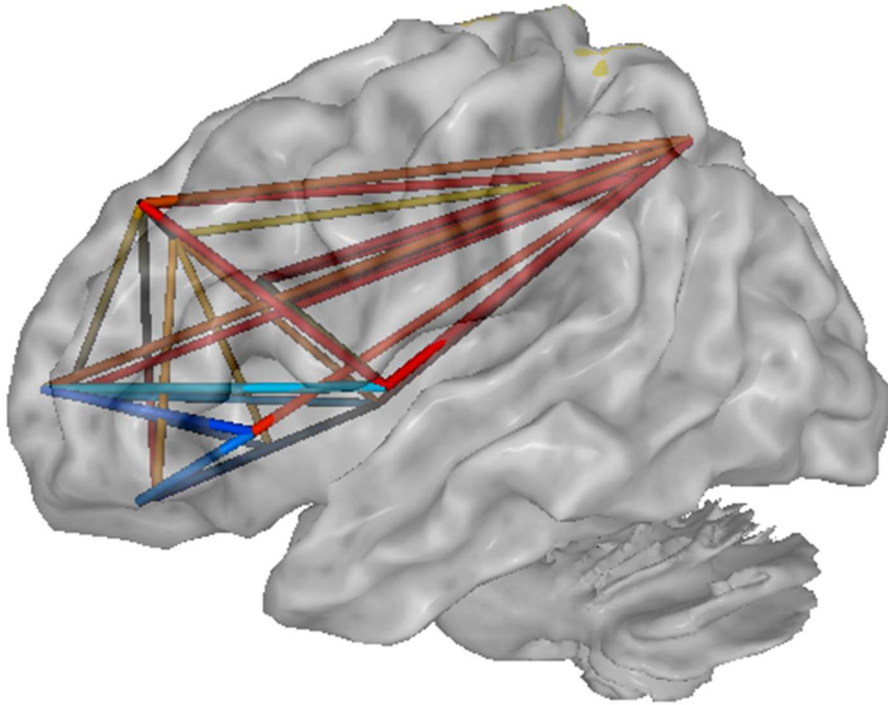
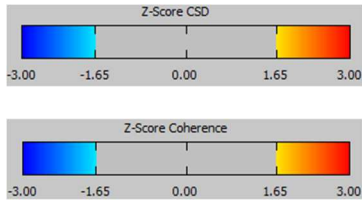


Current Density & Phase

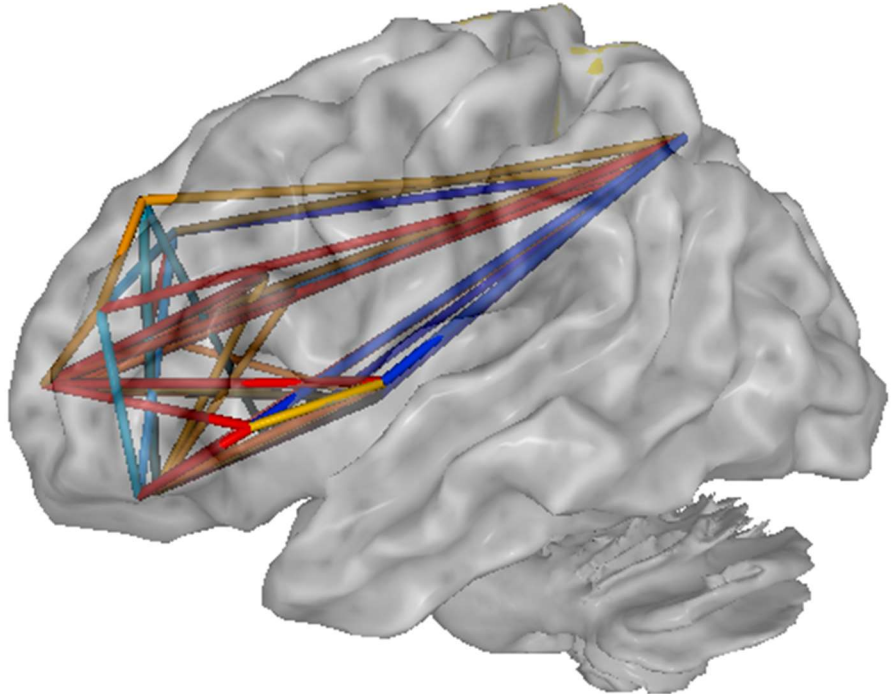
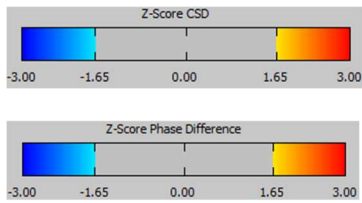


Obsessive Thoughts:

Current Density & Coherence



Current Density & Phase





PROTOCOL SELECTIONS

PROTOCOL 1: Eyes Open

swLORETA Absolute Power		
22L	Alpha 2	
23L	Alpha 2	Beta 3
23R	Alpha 2	Beta 3
24L	Alpha 2	
24R	Alpha 2	
31L	Alpha 2	Beta 3
31R	Alpha 2	Beta 3
32L	Alpha 2	
33L	Alpha 2	
33R	Alpha 2	
39L	Alpha 2	
40L	Alpha 2	
40R	Alpha 2	
41L	Alpha 2	
42L	Alpha 2	
44L	Alpha 2	
44R	Alpha 2	
4L	Alpha 2	
5L	Alpha 2	
5R	Alpha 2	
6L	Alpha 2	
7L	Alpha 2	
7R	Alpha 2	
8L	Alpha 2	
8R	Alpha 2	
9L	Alpha 2	
9R	Alpha 2	
hipL	Alpha 2	

swLORETA Coherence	
10L - 13aL	Alpha 2
10R - 19R	Beta 1
11L - 37L	Alpha 2
13aR - 13pR	Beta 1
19R - 22L	Beta 1
19R - 40L	Beta 1
32L - 40L	Beta 1
37R - 40L	Beta 1
4L - 10R	Beta 1
4L - 13pL	Beta 1
6L - 13pL	Beta 1
6R - 13pR	Beta 1
7L - 13pL	Beta 1
7L - 13pR	Beta 1
7L - 21R	Beta 1
7L - 22R	Beta 1
7L - 24L	Beta 1
7L - 30L	Beta 1
7L - 33L	Beta 1
7L - 37R	Beta 1
7L - 39L	Beta 1
7L - 8L	Beta 1
7L - hipL	Beta 1
7L - hipR	Beta 1
7L - NucAcCL	Beta 1
7R - 10R	Beta 1
7R - 13pL	Beta 1
7R - 13pR	Beta 1
7R - 21L	Beta 1
7R - 22L	Beta 1
7R - 8R	Beta 1
7R - hipL	Beta 1
7R - hipR	Beta 1
8L - 40L	Beta 1
8L - hipL	Beta 1
8R - 22R	Beta 1
8R - 40R	Beta 1
9L - 40L	Beta 1
9R - 22R	Beta 1
9R - 40L	Delta

swLORETA Phase			
10L - 45L	Beta 1		
13aR - 13pR	Beta 1		
13pR - amyL	Beta 1		
13pR - amyR	Alpha 2	Beta 1	
13pR - NucAccR	Alpha 2	Beta 1	
17L - 17R	Alpha 2		
17R - 18L	Alpha 2		
19L - amyL	Beta 1		
22L - 40L	Alpha 2		
24R - 32R	Alpha 2	Beta 1	
28L - 39L	Beta 1		
28L - 40L	Alpha 2	Beta 1	
30L - 31L	Alpha 2		
30L - 40L	Alpha 2	Beta 1	Beta 3
30R - 40L	Beta 1		
40L - 41L	Alpha 2		
40L - 42L	Alpha 2		
40L - hipL	Alpha 2		
44L - 45L	Alpha 2		
4L - 13aL	Alpha 2	Beta 1	
4L - 13pL	Alpha 2	Beta 1	
4L - 21L	Beta 1		
4L - 30L	Alpha 2	Beta 1	
4L - amyL	Alpha 2	Beta 1	
4L - amyR	Alpha 2		
4L - NucAcCL	Alpha 2	Beta 1	
4R - 6R	Beta 1		
6L - 13pL	Alpha 2	Beta 1	
6L - 30L	Alpha 2	Beta 1	
6L - amyL	Alpha 2	Beta 1	
6L - amyR	Alpha 2		
6L - NucAcCL	Alpha 2	Beta 1	
7L - 28L	Beta 1		
7L - 39L	Alpha 2		
7R - 9R	Beta 1		
8R - 40R	Beta 1		
8R - 47L	Alpha 2		
9R - 11L	Alpha 2		
9R - 40R	Beta 1		
9R - 46L	Alpha 2		

Both alpha 2 and beta 1 bandwidths are the main bandwidths targeted in patient's SW-LORETA protocol.

DISCUSSION AND RECOMMENDATIONS

SW-LORETA protocol selections listed on the previous page target current source density, coherence, and phase. Brodmann areas selected for training are associated with the patient's symptoms and diagnoses. Specifically, anxiety, OCD, and sleep difficulties are treated as highest priority and more Brodmann areas are pulled from these networks and regions as a result. The remaining spaces allotted for training (total of 40 for SW-LORETA for each data type) are filled with Brodmann areas associated with the remaining symptoms provided by the patient's clinician.

Results indicate that Brodmann regions associated with the somatosensory cortex, memory and executive functions, emotional regulation, and speech production and articulation are deviant. By training to the provided protocol, the patient can move these regions towards the norm. It is believed that, as these regions migrate in the appropriate direction, the patient should begin to feel improvements in their reported symptoms.

It is recommended that the patient train in the eyes open state for 10 sessions to protocol 1 (shown on previous page and training file included with this report). After 10 sessions, a re-evaluation is recommended to assess new shifts.

Disclaimer:

This QEEG report *does not constitute a diagnosis* but outlines areas of the brain where EEG may vary from established norms or may compare to clinical databases or studies of dysregulation.