

Investigating Neurophysiological Response to Voluntary Rapid Head Motion

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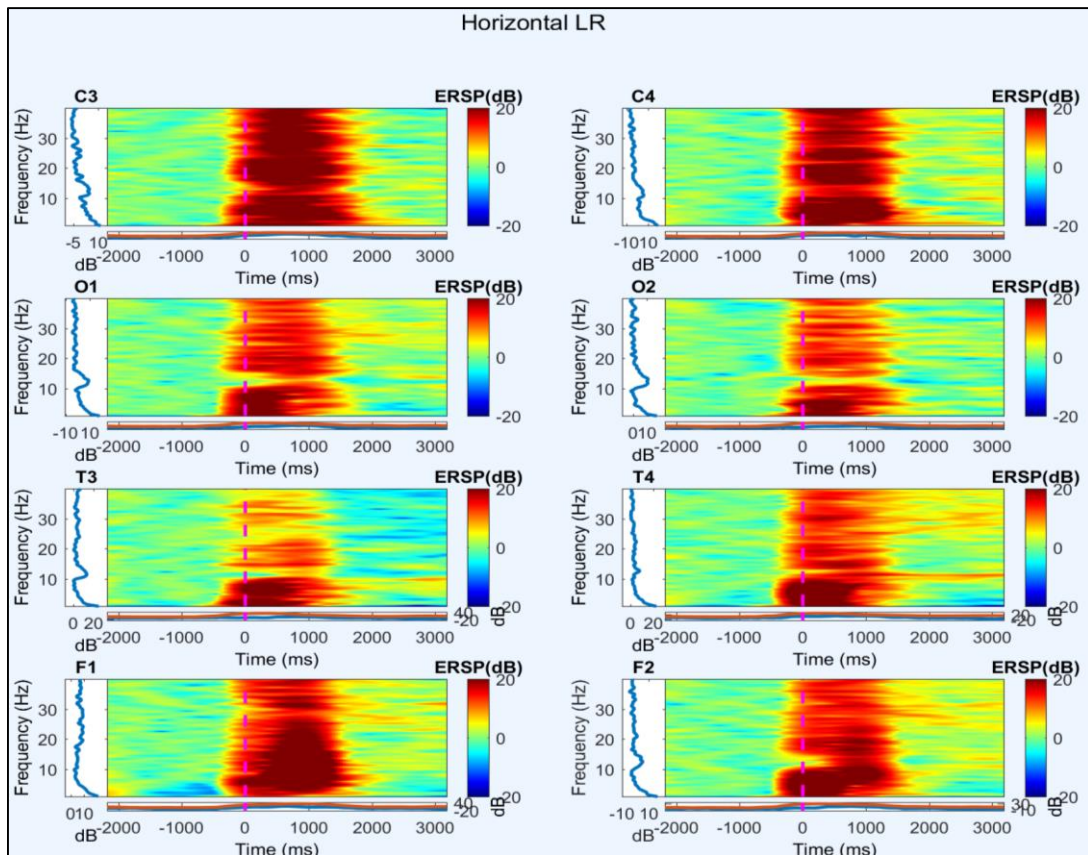


Figure 1: A spectrogram analysis for each electrode channel during a left to right voluntary rapid horizontal rotation

This project investigated the neurophysiological response of the brain before, during, and after high speed voluntary motion. Electroencephalography signals, or brain waves, were recorded with kinematic data during voluntary participant motion from one extremity of motion range to the other. Data was recorded for motions in the horizontal (shaking), coronal (tilting), and sagittal (nodding) planes. Interesting results showing differences in brain power levels before and after the voluntary motions were observed during this project, however they must be further validated and confirmed before meaning can truly be interpreted. These results suggest that high velocity head rotation can temporarily affect brain function, even if performed with low accelerations. This research is helping to determine the biomechanical dose of head impacts that lead to visible neurological changes (concussion), as it has been shown that smaller, non-concussive impacts can accumulate in concussion like damage.

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