1145-92-2002 **Abigail T. Small*** (`asmall873@g.rwu.edu`) and **Edward T. Dougherty** (`edougherty@rwu.edu`). *A Mathematical Approach for assessing tDCS efficacy for Post-Traumatic Stress Disorder.* Preliminary report.

Post-Traumatic Stress Disorder (PTSD) is a neurological condition caused by distressing or traumatic events. It has been recently found that symptoms of PTSD can be combated using forms of neurostimulation, in particular, transcranial direct current stimulation (tDCS). While it is known that the electrical energy delivered by this treatment to targeted portions of the brain is effective in treating PTSD, the optimal positioning of tDCS electrodes and treatment parameters for achieving the greatest treatment efficacy for an individualized patient is unknown. We have implemented a partial differential equation based mathematical model of tDCS with application to PTDS, and have generated numerous numerical simulations using the finite element method, all using distinct electrode montages, treatment parameters known to mitigate PTSD symptoms, and a three-dimensional MRI-derived cranial cavity with biologically-based tissue conductivities. The model provides a prediction not only of voltage and electrical current density within the head cavity, but also of the sensitivity of the brain tissue to fire an action potential during treatments. We present our current results and findings that begin to shed light on optimal tDCS settings for treating Post-Traumatic Stress Disorder. (Received September 24, 2018)