

Abstract Submitted  
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**Effect of Anatomical Variability in Brain on Transcranial Magnetic Stimulation Treatment** FARHEEN SYEDA, HAMZAH MAGSOOD, Virginia Commonwealth University, ERIK LEE, Massachusetts General Hospital, AHMED EL-GENDY, Virginia Commonwealth University, DAVID JILES, Iowa State University, RAVI HADIMANI, Virginia Commonwealth University — Transcranial Magnetic Stimulation is non-invasive clinical therapy for depression and migraine, and shows promise as treatment for Parkinson's disease, Alzheimer's disease, and other neurological disorders. However, it is yet unclear as to how anatomical differences may affect stimulation from this treatment. We use finite element analysis to model and analyze the results of Transcranial Magnetic Stimulation in various head models. A number of heterogeneous head models have been developed using MRI data of real patients, including healthy individuals as well as patients of Parkinson's disease. Simulations of Transcranial Magnetic Stimulation performed on 22 anatomically different models highlight the differences in induced stimulation. A standard Figure 8 coil is used with frequency 2.5 kHz, placed 5 mm above the head. We compare cortical stimulation, volume of brain tissue stimulated, focality, and maximum E-field induced in the brain for models ranging from ages 20 to 60. Results show that stimulation varies drastically between patients of the same age and health status depending upon brain-scalp distance, which is not necessarily a linear progression with age.

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