

Abstract Submitted  
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**Determination of stimulation focality in heterogeneous head models during transcranial magnetic stimulation (TMS)<sup>1</sup>** ERIK LEE, RAVI HADIMANI, DAVID JILES, Department of Electrical and Computer Engineering, Iowa State University — Transcranial Magnetic Stimulation (TMS) is an increasingly popular tool used by both the scientific and medical community to understand and treat the brain. TMS has the potential to help people with a wide range of diseases such as Parkinson's, Alzheimer's, and PTSD, while currently being used to treat people with chronic, drug-resistant depression. Through computer simulations, we are able to see the electric field that TMS induces in anatomical human models, but there is no measure to quantify this electric field in a way that relates to a specific patient undergoing TMS therapy. We propose a way to quantify the focality of the induced electric field in a heterogeneous head model during TMS by relating the surface area of the brain being stimulated to the total volume of the brain being stimulated. This figure would be obtained by conducting finite element analysis (FEA) simulations of TMS therapy on a patient specific head model. Using this figure to assist in TMS therapy will allow clinicians and researchers to more accurately stimulate the desired region of a patient's brain and be more equipped to do comparative studies on the effects of TMS across different patients.

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