

Abstract Submitted  
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**Comparison of Coil Designs for Transcranial Magnetic Stimulation on Mice**<sup>1</sup> PRIYAM RASTOGI, RAVI HADIMANI, DAVID JILES, Department of Electrical and Computer Engineering, Iowa State University — Transcranial magnetic stimulation (TMS) is a non-invasive treatment for neurological disorders using time varying magnetic field. The electric field generated by the time varying magnetic field is used to depolarize the brain neurons which can lead to measurable effects. TMS provides a surgical free method for the treatment of neurological brain disorders like depression, post-traumatic stress disorder, traumatic brain injury and Parkinson's disease. Before using TMS on human subjects, it is appropriate that its effects are verified on animals such as mice. The magnetic field intensity and stimulated region of the brain can be controlled by the shape, position and current in the coils. There are few reports on the designs of the coils for mice. In this paper, different types of coils are developed and compared using an anatomically realistic mouse model derived from MRI images. Parameters such as focality, depth of the stimulation, electric field strength on the scalp and in the deep brain regions, are taken into account. These parameters will help researchers to determine the most suitable coil design according to their need. This should result in improvements in treatment of specific disorders.

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