

Abstract Submitted
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Quadruple Cone Coil with improved focality than Figure-8 coil in Transcranial Magnetic Stimulation¹ PRIYAM RASTOGI², Department of Electrical and Computer Engineering, Iowa State University, Ames, Iowa 50011, USA, ERIK G. LEE, Department of Psychiatry, Massachusetts General Hospital, Harvard Medical School, Charlestown, Massachusetts 02129, USA, RAVI L. HADIMANI, Department of Mechanical and Nuclear engineering, Virginia Commonwealth University, Richmond, Virginia 23284, USA, DAVID C. JILES, Department of Electrical and Computer Engineering, Iowa State University, Ames, Iowa 50011, USA — Transcranial Magnetic Stimulation (TMS) is a non-invasive therapy which uses a time varying magnetic field to induce an electric field in the brain and to cause neuron depolarization. Magnetic coils play an important role in the TMS therapy since their coil geometry determines the focality and penetration's depth of the induced electric field in the brain. Quadruple Cone Coil (QCC) is a novel coil with an improved focality when compared to commercial Figure-8 coil. The results of this newly designed QCC coil are compared with the Figure-8 coil at two different positions of the head - vertex and dorsolateral prefrontal cortex, over the 50 anatomically realistic MRI derived head models. Parameters such as volume of stimulation, maximum electric, area of stimulation and location of maximum electric field are determined with the help of computer modelling of both coils. There is a decrease in volume of brain stimulated by 11.6 % and a modest improvement of 8 % in the location of maximum electric field due to QCC in comparison to the Figure-8 coil.

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