**Deep Brain Stimulation using Magnetic Fields** DAVID JILES, Iowa State University, Ames, Iowa 50011, PAUL WILLIAMS, LAWRENCE CROWTHER, Wolfson Centre for Magnetics, Cardiff University, United Kingdom, IOWA STATE UNIVERSITY TEAM, WOLFSON CENTRE FOR MAGNETICS TEAM — New applications for transcranial magnetic stimulation are developing rapidly for both diagnostic and therapeutic purposes. Therefore so is the demand for improved performance, particularly in terms of their ability to stimulate deeper regions of the brain and to do so selectively. The coil designs that are used presently are limited in their ability to stimulate the brain at depth and with high spatial focality. Consequently, any improvement in coil performance would have a significant impact in extending the usefulness of TMS in both clinical applications and academic research studies. New and improved coil designs have then been developed, modeled and tested as a result of this work. A large magnetizing coil, 300mm in diameter and compatible with a commercial TMS system has been constructed to determine its feasibility for use as a deep brain stimulator. The results of this work have suggested directions that could be pursued in order to further improve the coil designs.

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