

Triple Halo Transcranial Magnetic Stimulation Coil

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Technology description

Description:

Transcranial Magnetic Stimulation (TMS) is a non-invasive, safe method for the treatment of neurologic disorders such as depression, Post-Traumatic Stress Disorder, and Parkinson's disease. Currently, TMS is FDA approved for the treatment of depression. The existing commercial TMS coils can only stimulate the cortical regions of the brain. For the success of the treatment of other neurological disorders, there is a need for the development of TMS coils that can stimulate deeper regions of the brain.

Development of deep brain stimulation coils is challenging as the magnetic field decays rapidly with the distance from the source (coil surface). Magnetic fields with sufficient magnitude to stimulate the deeper regions of the brain should not stimulate the scalp of the patients. ISU researchers have developed a novel coil design based on our earlier "Halo Coil" configuration. This design of the new coil called the "Triple Halo Coil" will be able to stimulate deeper regions of the brain.

Application area

Health care

Transcranial Magnetic Stimulation

Advantages

- The first of its kind that could potentially be used for the treatment of deep brain disorders non-invasively, safely and in an out-patient setting
- Capable of stimulating deeper regions of the brain with more than 10 times the magnetic field for the same amount of surface field at a depth of 10 cm
- Coils have been configured such that they do not overstimulate any part of the brain surface
- Electric and magnetic fields were calculated in heterogeneous head models

Institution

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