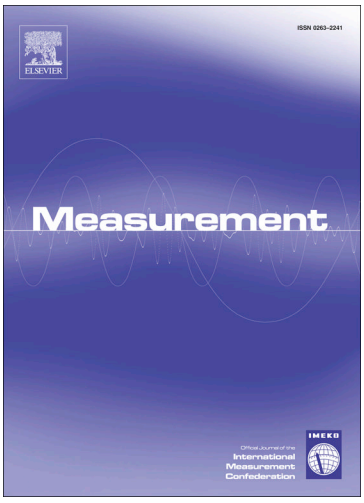

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Measurement of Transcranial Magnetic Stimulation Resolution in 3-D Spaces

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ABSTRACT

This research is executed to measure the transcranial magnetic stimulation (TMS) systems resolution. For the first time in this study, voxel resolution is proposed and exploited to evaluate TMS systems accuracy. To reach this goal novel procedure in four steps is presented. First, a small recording electrode is implanted in the targeted point of the brain, and then stimulation session is started. Induced potential in micro coil is measured and digitalized. Then the transcranial stimulation coil and test object are moved by micromanipulator and next measuring stage starts. The manipulator will sweep the 512 microliter by step of 400 micrometer in 3-D spaces. Ultimately the measured resolution for particular stimulation coil/core is calculated. The prototype of suggested process is fabricated and tasted by in vitro and in vivo experiments. The experimental outcomes and finite element analysis results proved that the offered procedure is a powerful investigational device to measure TMS systems resolution.

KEYWORDS: transcranial magnetic stimulation, TMS resolution, voxel resolution, 3-D resolution, rat micromanipulator.