

Faculty Name:

Christoph Juchem

Faculty Email:

cwj2112@columbia.edu

Lab:

MR Scientific Engineering for Clinical Excellence (MR SCIENCE) Laboratory,
<http://juchem.bme.columbia.edu/>

Project Title:

Field Probe System for Spatio-Temporal B0 Field Characterization in a Head-Only MR Scanner

Description:

"Our group recently developed a compact multi-coil array (MCA) for magnetic field manipulation in an accessible 1.5 T head-only magnetic resonance imaging (MRI) system. Due to its compact design, the main magnetic field of this scanner is far less homogeneous than in traditional, much larger MRI scanners. Established MR imaging protocols rely on predictable B0 field conditions and are thus expected to be less reliable in this system, potentially leading to image degradation and artifacts.

In order to accurately measure the spatio-temporal behavior of the B0 magnetic field in this system without relying on the accuracy of the spatial encoding of the MCA, we are utilizing a field probe approach. Here, a small spherical probe is used to generate a signal from a defined point in space and the local magnetic field and its temporal behavior is measured using traditional MRI methods. By repeating this with the probe in several different locations, the full spatio-temporal behavior can be investigated accurately. This approach can be used for both the mapping of the main magnetic B0 field as well as for the investigation of so-called eddy currents that occur during the switching of image encoding fields. The project comprises the design, construction, implementation, validation and use of the field probe system at hand."

Location of Research:

On-Site

of hrs/week:

40

Department/Program:

Biomedical Engineering

Eligibility:

MS

To apply, please contact:

cwj2112@columbia.edu