11th CONFERENCE ON FAST FIELD CYCLING NMR RELAXOMETRY

TOWARDS A MODEL-BASED FIELD-FREQUENCY LOCK FOR FAST FIELD CYCLING MRI: HANDLING THE EFFECT OF GRADIENTS

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Fast Field Cycling Magnetic Resonance Imaging (FFC MRI) aims at exploring the dependence of tissues relaxation rates on the magnetic field strength on a full-body scale, to provide unique structural information on materials in a non-invasive way. Magnetic field stability is a key issue of this challenge, since a stable magnetic field is required to guarantee precise and resolved results. Field-Frequency Lock (FFL) systems are currently under development for Fast Field Cycling Nuclear Magnetic Resonance (FFC NMR), but the presence of field gradients requires ad-hoc solutions to guarantee stability in every phase of the acquisition sequence in an MRI experiment. This work proposes two strategies to adapt FFC Field-Frequency Locks to explicitly consider the presence of field gradients. The two approaches are investigated in simulations, and the results analyzed to define which strategy could better suit the contest of a full-body FFC MRI scanner.

Acknowledgment

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 668119 (project “IDentIFY”).

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