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The Highs and Lows of Magnetic Resonance Metrology



Magnetic resonance, both spectroscopy (NMR) and imaging (MRI), is an ever-changing field with recent advances pushing magnetic fields to new highs and new lows. These recent developments include devices such as whole body 11.7T as well as 65 mT head-only MRI systems. As new systems are developed at these extremes, the need for well characterized measurements is key to quantitative results. I will discuss several the challenges we have faced in developing these reference measurements as well as some of the unique instruments we are developing at NIST. In addition to the metrology related to the medical field, I will present research in radiofrequency pulse fidelity, transmit/receive switching, and unilateral magnets.

Short bio

Karl Stupic is a research scientist at the National Institute of Standards and Technology in Boulder Colorado in the Magnetic Imaging Group. His research interests range from advanced imaging techniques such as spin-enhancement to novel equipment for magnetic resonance at both low and high magnetic fields. Karl maintains a research view of medically relevant topics as well as a growing projects on taking magnetic resonance out of the laboratory and into industrially and agriculturally relevant areas.

Karl received a Ph.D. from Colorado State University in the Meersmann Group working on Quadrupolar Nuclei and a B.S. from Juniata College, both in the area of chemistry. Prior to NIST, Karl did a post-doctoral fellowship at the University of Nottingham in translational imaging at the School of Medicine.