Matt A. Bernstein, PhD

Editor-In-Chief, *Magnetic Resonance in Medicine*

c/o ISMRM

2300 Clayton Rd. #620

Concord, CA, 94520

USA

December 14, 2017

Dear Dr. Bernstein,

Please find enclosed the manuscript entitled: “*Sensitivity-Regularization of the Cramér-Rao Lower Bound to Minimize B1 Nonuniformity Effects in Quantitative Magnetization Transfer Imaging*” to be considered for publication as a Full Paper in *Magnetic Resonance in Medicine*. In this work, we examined the potential of optimizing quantitative magnetization transfer (qMT) fitted parameters against B1-inaccuracies by developing and implementing a sensitivity-regularized approach of acquisition protocol design. Using Monte Carlo simulations, we evaluated a protocol optimized by sensitivity-regularization against two other protocols (unregularized optimization, and uniform sampling) for a wide range of conditions (B1 errors, signal-to-noise values, tissue types). The qMT optimization software developed in this work is being released as an open-source project online. This work demonstrates that using by using the proposed optimization approach, the pool-size ratio (F), a qMT parameter that correlates with demyelination and remyelination in multiple sclerosis lesions, can be optimized for reduced sensitivity against B1 inaccuracies, so much so that B1 mapping could be omitted without substantially biasing F (<1%).

Please note that in our submission form, we have indicated two opposed potential reviewers for this work. The reason for this is that both individuals have already agreed to be examiners for a PhD thesis that includes this work.

Overall, we believe that this work will be of interest to the Magnetic Resonance in Medicine readership, and request your consideration for publication.

Sincerely,

Mathieu Boudreau, MSc

McConnell Brain Imaging Center

Montreal Neurological Institute, McGill University

Room WB325, 3801 University Street, Montreal, Quebec, Canada, H3A 2B4

Tel: (438) 822-8747

E-mail: mathieu.boudreau2@mail.mcgill.ca