

The highlighted papers are those papers recognized by the reviewers as supporting MRM's goal of Reproducible Research.

## CONTENTS

### ■ SPECTROSCOPIC METHODOLOGY

#### Research Article

**Spatially resolved free-induction decay spectroscopy using a 3D ultra-short echo time multi-echo imaging sequence with systematic echo shifting and compensation of  $B_0$  field drifts,** Anja Fischer, Petros Martirosian, Thomas Benkert, and Fritz Schick.....2099  
*Published online 6 December 2021*

#### Technical Note

**Broadband selective excitation radiofrequency pulses for optimized localization in vivo,** Lana G. Kaiser, Mikhail Veshtort, Ioannis Pappas, Dinesh K. Deelchand, Edward J. Auerbach, Małgorzata Marjańska, and Ben A. Inglis.....2111  
*Published online 6 December 2021*

### ■ PRECLINICAL AND CLINICAL SPECTROSCOPY

#### Technical Note

**Multi-band echo-planar spectroscopic imaging of hyperpolarized  $^{13}\text{C}$  probes in a compact preclinical PET/MR scanner,** Cornelius von Morze, Tyler Blazey, Richard Baeza, Ruslan Garipov, Timothy Whitehead, Galen D. Reed, Joel R. Garbow, and Kooresh I. Shoghi.....2120  
*Published online 31 December 2021*

### ■ IMAGING METHODOLOGY

#### Research Articles

**Genetic algorithm-based optimization of pulse sequences,** Vencel Somai, Felix Kreis, Adam Gaunt, Anastasia Tsyben, Ming Li Chia, Friederike Hesse, Alan J. Wright, and Kevin M. Brindle.....2130  
*Published online 6 December 2021*

**$T_2$  quantification in brain using 3D fast spin-echo imaging with long echo trains,** Jeff Snyder, Kelly C. McPhee, and Alan H. Wilman .....2145  
*Published online 11 December 2021*

**Selective RF excitation designs enabled by time-varying spatially non-linear  $\Delta B_0$  fields with applications in fetal MRI,** Molin Zhang, Nicolas Arango, Jason P. Stockmann, Jacob White, and Elfar Adalsteinsson.....2161  
*Published online 21 December 2021*

#### NeuroMix—A single-scan brain exam,

Tim Sprenger, Annika Kits, Ola Norbeck, Adam van Niekerk, Johan Berglund, Henric Rydén, Enrico Avventi, and Stefan Skare .....2178  
*Published online 14 December 2021*

**Fast multi-parametric imaging in abdomen by  $B_1^+$  corrected dual-flip angle sequence with interleaved echo acquisition,** Hao Peng, Chuanli Cheng, Qian Wan, Sen Jia, Shuai Wang, Jianxun Lv, Dong Liang, Wenzhong Liu, Xin Liu, Hairong Zheng, and Chao Zou.....2194  
*Published online 10 December 2021*

**Characterization and correction of time-varying eddy currents for diffusion MRI,** Jake J. Valsamis, Paul I. Dubovan, and Corey A. Baron.....2209  
*Published online 11 December 2021*

**Thermal variation in gradient response: measurement and modeling,** Jennifer Nussbaum, Benjamin E. Dietrich, Bertram J. Wilm, and Klaas P. Pruessmann.....2224  
*Published online 21 December 2021*

**A simultaneous multi-slice  $T_2$  mapping framework based on overlapping-echo detachment planar imaging and deep learning reconstruction,** Simin Li, Jian Wu, Lingceng Ma, Shuhui Cai, and Congbo Cai .....2239  
*Published online 11 January 2022*

**Rigid motion-resolved  $B_1^+$  prediction using deep learning for real-time parallel-transmission pulse design,** Alix Plumley, Luke Watkins, Matthias Treder, Patrick Liebig, Kevin Murphy, and Emre Kopanoglu.....2254  
*Published online 27 December 2021*

**Repeatability and robustness of MP-GRASP  $T_1$  mapping,** Zhitao Li, Xiang Xu, Yang Yang, and Li Feng.....2271  
*Published online 31 December 2021*

**Age-dependent cerebrospinal fluid-tissue water exchange detected by magnetization transfer indirect spin labeling MRI,** Anna M. Li, Lin Chen, Hongshuai Liu, Yuguo Li, Wenzhen Duan, and Jiadi Xu.....2287  
*Published online 27 December 2021*

# CONTENTS

**Simultaneous 3D acquisition of  $^1\text{H}$  MRF and  $^{23}\text{Na}$  MRI,** Zidan Yu, Shota Hodono, Olga Dergachyova, Tom Hilbert, Bili Wang, Bei Zhang, Ryan Brown, Daniel K. Sodickson, Guillaume Madelin, and Martijn A. Cloos .....2299  
*Published online 31 December 2021*

**$T_{1D}$ -weighted ihMT imaging – Part I. Isolation of long- and short- $T_{1D}$  components by  $T_{1D}$ -filtering,** Andreea Hertanu, Lucas Soustelle, Arnaud Le Troter, Julie Buron, Julie Le Priellec, Victor N. D. Carvalho, Myriam Cayre, Pascale Durbec, Gopal Varma, David C. Alsop, Olivier M. Girard, and Guillaume Duhamel .....2313  
*Published online 17 January 2021*

**$T_{1D}$ -weighted ihMT imaging – Part II. Investigating the long- and short- $T_{1D}$  components correlation with myelin content. Comparison with  $R_1$  and the macromolecular proton fraction,** Andreea Hertanu, Lucas Soustelle, Julie Buron, Julie Le Priellec, Myriam Cayre, Arnaud Le Troter, Gopal Varma, David C. Alsop, Pascale Durbec, Olivier M. Girard, and Guillaume Duhamel .....2329  
*Published online 9 January 2021*

**Cartesian dictionary-based native  $T_1$  and  $T_2$  mapping of the myocardium,** Markus Henningsson .....2347  
*Published online 5 January 2022*

## Technical Notes

**Whole-brain steady-state CEST at 3 T using MR multitasking,** Pei Han, Karandeep Cheema, Hsu-Lei Lee, Zhengwei Zhou, Tianle Cao, Sen Ma, Nan Wang, Hui Han, Anthony G. Christodoulou, and Debiao Li .....2363  
*Published online 29 November 2021*

**Three-dimensional reduced field-of-view imaging (3D-rFOVI),** Kaibao Sun, Zheng Zhong, Guangyu Dan, Muge Karaman, Qingfei Luo, and Xiaohong Joe Zhou .....2372  
*Published online 11 December 2021*

**Optimization of magnetization transfer contrast for EPI FLAIR brain imaging,** Serdest Demir, Bryan Clifford, Wei-Ching Lo, Azadeh Tabari, Augusto Lio M. Goncalves Filho, Min Lang, Stephen F. Cauley, Kawin Setsompop, Berkin Bilgic, Michael H. Lev, Pamela W. Schaefer, Otto Rapalino, Susie Y. Huang, Tom Hilbert, Thorsten Feiweier, and John Conklin .....2380  
*Published online 5 January 2022*

**On the fat saturation effect in quantitative ultrashort TE MR imaging,** Yanjun Chen, Liang Li, Nicole Le, Eric Y. Chang, Wenhua Huang, and Ya-Jun Ma .....2388  
*Published online 5 January 2022*

## PRECLINICAL AND CLINICAL IMAGING

### Research Articles

**Echo planar imaging-induced errors in intracardiac 4D flow MRI quantification,** Jos J. M. Westenberg, Hans C. van Assen, Pieter J. van den Boogaard, Jelle J. Goeman, Hicham Saaid, Jason Voorneveld, Johan Bosch, Sasa Kenjeres, Tom Claessens, Pankaj Garg, Marc Kouwenhoven, and Hildo J. Lamb .....2398  
*Published online 5 December 2021*

**A subject-specific assessment of measurement errors and their correction in cerebrospinal fluid velocity maps using 4D flow MRI,** Selin Yavuz Ilik, Tomohiro Otani, Shigeki Yamada, Yoshiyuki Watanabe, and Shigeo Wada .....2412  
*Published online 6 December 2021*

**Comparing and combining MRE,  $T1\rho$ , SWI, IVIM, and DCE-MRI for the staging of liver fibrosis in rabbits: Assessment of a predictive model based on multiparametric MRI,** Liqiu Zou, Jinzhao Jiang, Hao Zhang, Wenxin Zhong, Min Xiao, Shunbao Xin, Yang Wang, and Wei Xing .....2424  
*Published online 21 December 2021*

**Mapping intracellular pH in tumors using amide and guanidyl CEST-MRI at 9.4 T,** Philip S. Boyd, Johannes Breitling, Andreas Korzowski, Moritz Zaiss, Vanessa L. Franke, Karin Mueller-Decker, Andrey Glinka, Mark E. Ladd, Peter Bachert, and Steffen Goerke .....2436  
*Published online 27 December 2021*

### Technical Note

**An artificial intelligence-accelerated 2-minute multi-shot echo planar imaging protocol for comprehensive high-quality clinical brain imaging,** Bryan Clifford, John Conklin, Susie Y. Huang, Thorsten Feiweier, Zahra Hosseini, Augusto Lio M. Goncalves Filho, Azadeh Tabari, Serdest Demir, Wei-Ching Lo, Maria Gabriela Figueiro Longo, Michael Lev, Pam Schaefer, Otto Rapalino, Kawin Setsompop, Berkin Bilgic, and Stephen Cauley .....2453  
*Published online 31 December 2021*

## BIOPHYSICS AND BASIC BIOMEDICAL RESEARCH

### Research Articles

**Safety of MRI in patients with retained cardiac leads,** Bach T. Nguyen, Bhumi Bhusal, Amir Ali Rahsepar, Kate Fawcett, Stella Lin, Daniel S. Marks, Rod Passman, Donny Nieto, Richard Niemzcura, and Laleh Golestanirad .....2464  
*Published online 27 December 2021*

# CONTENTS

**Developing formalin-based fixative agents for post mortem brain MRI at 9.4 T,** Azadeh Nazemorroaya, Ali Aghaeifar, Thomas Shiozawa, Bernhard Hirt, Hildegard Schulz, Klaus Scheffler, and Gisela E. Hagberg .....2481  
*Published online 21 December 2021*

**Virtual injections using 4D flow MRI with displacement corrections and constrained probabilistic streamlines,** Grant S. Roberts, Michael W. Loecher, Alma Spahic, Kevin M. Johnson, Patrick A. Turski, Laura B. Eisenmenger, and Oliver Wieben .....2495  
*Published online 31 December 2021*

## **Technical Note**

**Physiological effects of human body imaging with 300 mT/m gradients,** Malwina Molendowska, Fabrizio Fasano, Umesh Rudrapatna, Ralph Kimmlingen, Derek K. Jones, Slawomir Kusmia, Chantal M. W. Tax, and C. John Evans .....2512  
*Published online 21 December 2021*

## **COMPUTER PROCESSING AND MODELING**

### **Research Articles**

**Data-driven algorithm for myelin water imaging: Probing subvoxel compartmentation based on identification of spatially global tissue features,** Noam Omer, Meirav Galun, Neta Stern, Tamar Blumenfeld-Katzir, and Noam Ben-Eliezer .....2521  
*Published online 27 December 2021*

**Estimation of the capillary level input function for dynamic contrast-enhanced MRI of the breast using a deep learning approach,** Jonghyun Bae, Zhengnan Huang, Florian Knoll, Krzysztof Geras, Terlika Pandit Sood, Li Feng, Laura Heacock, Linda Moy, and Sungheon Gene Kim.....2536  
*Published online 9 January 2022*

## **HARDWARE AND INSTRUMENTATION**

### **Research Articles**

**Integration of an RF coil and commercial field camera for ultrahigh-field MRI,** Kyle M. Gilbert, Paul I. Dubovan, Joseph S. Gati, Ravi S. Menon, and Corey A. Baron .....2551  
*Published online 21 December 2021*

**Twenty-four-channel high-impedance glove array for hand and wrist MRI at 3T,** Bei Zhang, Bili Wang, Justin Ho, Shota Hodono, Christopher Burke, Riccardo Lattanzi, Markus Vester, Robert Rehner, Daniel Sodickson, Ryan Brown, and Martijn Cloos .....2566  
*Published online 31 December 2021*