

CONTENTS

■ SPECTROSCOPIC METHODOLOGY

Rapid Communication

- Simultaneous QSM and Metabolic Imaging of the Brain Using SPICE**, Xi Peng, Fan Lam, Yudu Li, Bryan Clifford, and Zhi-Pei Liang 13
Published online 24 October 2017

Full Papers

- ³¹P Magnetization Transfer Magnetic Resonance Spectroscopy: Assessing the Activation Induced Change in Cerebral ATP Metabolic Rates at 3 T**, Chen Chen, Mary C. Stephenson, Andrew Peters, Peter G. Morris, Susan T. Francis, and Penny A. Gowland 22
Published online 16 March 2017

- Tailored Spiral In-Out Spectral-Spatial Water Suppression Pulses for Magnetic Resonance Spectroscopic Imaging**, Jun Ma, Carrie Wismans, Zhipeng Cao, Dennis W. J. Klomp, Jannie P. Wijnen, and William A. Grissom 31
Published online 31 March 2017

- GABA Editing With Macromolecule Suppression Using an Improved MEGA-SPECIAL Sequence**, Meng Gu, Ralph Hurd, Ralph Noeske, Laima Baltusis, Roeland Hancock, Matthew D. Sacchet, Ian H. Gotlib, Frederick T. Chin, and Daniel M. Spielman 41
Published online 31 March 2017

■ IMAGING METHODOLOGY

Review

- Quantitative Magnetic Resonance Imaging Phantoms: A Review and the Need for a System Phantom**, Kathryn E. Keenan, Maureen Ainslie, Alex J. Barker, Michael A. Boss, Kim M. Cecil, Cecil Charles, Thomas L. Chenevert, Larry Clarke, Jeffrey L. Evelhoch, Paul Finn, Daniel Gembris, Jeffrey L. Gunter, Derek L.G. Hill, Clifford R. Jack Jr., Edward F. Jackson, Guoying Liu, Stephen E. Russek, Samir D. Sharma, Michael Steckner, Karl F. Stupic, Joshua D. Trzasko, Chun Yuan, and Jie Zheng 48
Published online 30 October 2017

Rapid Communication

- Shuffled Magnetization-Prepared Multicontrast Rapid Gradient-Echo Imaging**, Peng Cao, Xucheng Zhu, Shuyu Tang, Andrew Leynes, Angela Jakary, and Peder E.Z. Larson 62
Published online 27 October 2017

Full Papers

- Multishot Echo-Planar MREIT for Fast Imaging of Conductivity, Current Density, and Electric Field Distributions**, Munish Chauhan, Rohini Vidya Shankar, Neeta Ashok Kumar, Vikram D. Kodibagkar, and Rosalind Sadleir 71
Published online 16 February 2017

- Low Rank Alternating Direction Method of Multipliers Reconstruction for MR Fingerprinting**, Jakob Assländer, Martijn A. Cloos, Florian Knoll, Daniel K. Sodickson, Jürgen Hennig, and Riccardo Lattanzi 83
Published online 5 March 2017

- The Challenge of Bias-Free Coil Combination for Quantitative Susceptibility Mapping at Ultra-High Field**, Steffen Bollmann, Simon Daniel Robinson, Kieran O'Brien, Viktor Vegh, Andrew Janke, Lars Marstaller, David Reutens, and Markus Barth 97
Published online 1 March 2017

- A Phantom Study to Determine the Theoretical Accuracy and Precision of Radial MRI to Measure Cross-Sectional Area Differences for the Application of Coronary Endothelial Function Assessment**, Jérôme Yerly, Danilo Gubian, Jean-Francois Knebel, Ali Schenk, Jerome Chaptinel, Giulia Ginami, and Matthias Stuber 108
Published online 5 March 2017; notable correction published online 21 March 2017

- Bone Quantitative Susceptibility Mapping Using a Chemical Species-Specific R₂* Signal Model With Ultrashort and Conventional Echo Data**, Alexey V. Dimov, Zhe Liu, Pascal Spincemaille, Martin R. Prince, Jiang Du, and Yi Wang 121
Published online 5 March 2017

- 3D Phase Contrast MRI: Partial Volume Correction for Robust Blood Flow Quantification in Small Intracranial Vessels**, Pierre Bouillot, Bénédicte M. A. Delattre, Olivier Brina, Rafik Ouared, Mohamed Farhat, Christophe Chnafa, David A. Steinman, Karl-Olof Lovblad, Vitor M. Pereira, and Maria I. Vargas 129
Published online 28 February 2017

CONTENTS

- High-Resolution In Vivo Diffusion Imaging of the Human Brain With Generalized Slice Dithered Enhanced Resolution: Simultaneous Multislice (gSlider-SMS),** Kawin Setsompop, Qiuyun Fan, Jason Stockmann, Berkin Bilgic, Susie Huang, Stephen F. Cauley, Aapo Nummenmaa, Fuyixue Wang, Yogesh Rathi, Thomas Witzel, and Lawrence L. Wald 141
Published online 5 March 2017
- Improved Olefinic Fat Suppression in Skeletal Muscle DTI Using a Magnitude-Based Dixon Method,** Jędrzej Burakiewicz, Melissa T. Hooijmans, Andrew G. Webb, Jan J.G.M. Verschuuren, Erik H. Niks, and Hermien E. Kan 152
Published online 5 March 2017
- Tracking Discrete Off-Resonance Markers With Three Spokes (trackDOTS) for Compensation of Head Motion and B_0 Perturbations: Accuracy and Performance in Anatomical Imaging,** João Jorge, Frédéric Gretsch, Daniel Gallichan, and José P. Marques 160
Published online 5 March 2017
- Quantitative Susceptibility Mapping-Based Cerebral Metabolic Rate of Oxygen Mapping With Minimum Local Variance,** Jingwei Zhang, Junghun Cho, Dong Zhou, Thanh D. Nguyen, Pascal Spincemaille, Ajay Gupta, and Yi Wang 172
Published online 10 March 2017
- Efficient Experimental Designs for Isotropic Generalized Diffusion Tensor MRI (IGDTI),** Alexandru V. Avram, Joelle E. Sarlls, Elizabeth Hutchinson, and Peter J. Basser 180
Published online 7 May 2017
- k-t Accelerated Aortic 4D Flow MRI in Under Two Minutes: Feasibility and Impact of Resolution, k-Space Sampling Patterns, and Respiratory Navigator Gating on Hemodynamic Measurements,** Emilie Bollache, Alex J Barker, Ryan Scott Dolan, James C Carr, Pim van Ooij, Rouzbeh Ahmadian, Alex Powell, Jeremy D Collins, Julia Geiger, and Michael Markl 195
Published online 7 March 2017
- Reduced Field of View Single-Shot Spiral Perfusion Imaging,** Yang Yang, Li Zhao, Xiao Chen, Peter W. Shaw, Jorge A. Gonzalez, Frederick H. Epstein, Craig H. Meyer, Christopher M. Kramer, and Michael Salerno 208
Published online 20 March 2017
- High-Speed Whole-Brain Oximetry by Golden-Angle Radial MRI,** Wen Cao, Yulin V. Chang, Erin K. Englund, Hee Kwon Song, Suliman Barhoum, Zachary B. Rodgers, Michael C. Langham, and Felix W. Wehrli 217
Published online 25 March 2017
- Acceleration of ASL-Based Time-Resolved MR Angiography by Acquisition of Control and Labeled Images in the Same Shot (ACTRESS),** Yuriko Suzuki, Noriyuki Fujima, Tetsuo Ogino, James Alastair Meakin, Akira Suwa, Hiroyuki Sugimori, Marc Van Cauteren, and Matthias J. P. van Osch 224
Published online 20 March 2017
- Joint System Relaxometry (JSR) and Crámer-Rao Lower Bound Optimization of Sequence Parameters: A Framework for Enhanced Precision of DESPOT T_1 and T_2 Estimation,** Rui Pedro A.G. Teixeira, Shaihan J. Malik, and Joseph V. Hajnal 234
Published online 16 March 2017
- Three-Dimensional Oxygen-Enhanced MRI of the Human Lung at 1.5T With Ultra-Fast Balanced Steady-State Free Precession,** Orso Pusterla, Grzegorz Bauman, and Oliver Bieri 246
Published online 24 March 2017
- High-Resolution Dynamic Oxygen-17 MR Imaging of Mouse Brain With Golden-Ratio-Based Radial Sampling and k-Space-Weighted Image Reconstruction,** Yuchi Liu, Yifan Zhang, Chunying Wu, Junqing Zhu, Charlie Wang, Nicholas Tomko, Mikhail D. Linetsky, Robert G. Salomon, Ciro Ramos-Estebanez, Yanming Wang, and Xin Yu 256
Published online 13 March 2017
- Rotating Single-Shot Acquisition (RoSA) With Composite Reconstruction for Fast High-Resolution Diffusion Imaging,** Qiuting Wen, Chandana Kodiweera, Brian M. Dale, Giri Shivraman, and Yu-Chien Wu 264
Published online 20 March 2017
- B_1 -Sensitivity Analysis of Quantitative Magnetization Transfer Imaging,** Mathieu Boudreau, Nikola Stikov, and G. Bruce Pike 276
Published online 27 March 2017
- Ultrafast Compartmentalized Relaxation Time Mapping With Linear Algebraic Modeling,** Yi Zhang, Xiaoyang Liu, Jinyuan Zhou, and Paul A. Bottomley 286
Published online 11 April 2017
- Spin-Lock Imaging of Exogenous Exchange-Based Contrast Agents to Assess Tissue pH,** Zhongliang Zu, Hua Li, Xiaoyu Jiang, and John C. Gore 298
Published online 20 March 2017
- Accelerated Radial Diffusion Spectrum Imaging Using a Multi-Echo Stimulated Echo Diffusion Sequence,** Steven H. Baete and Fernando E. Boada 306
Published online 31 March 2017

CONTENTS

Estimating Breast Tumor Blood Flow During Neoadjuvant Chemotherapy Using Interleaved High Temporal and High Spatial Resolution MRI, Leonidas Georgiou, Nisha Sharma, David A. Broadbent, Daniel J. Wilson, Barbara J. Dall, Anmol Gangi, and David L. Buckley 317
Published online 3 April 2017

Fetal Cardiac Cine Imaging Using Highly Accelerated Dynamic MRI With Retrospective Motion Correction and Outlier Rejection, Joshua F.P. van Amerom, David F.A. Lloyd, Anthony N. Price, Maria Kuklisova Murgasova, Paul Aljabar, Shaihan J. Malik, Maelene Lohezic, Mary A. Rutherford, Kuberan Pushparajah, Reza Razavi, and Joseph V. Hajnal..... 327
Published online 3 April 2017

Motion-Corrected Simultaneous Cardiac Positron Emission Tomography and Coronary MR Angiography With High Acquisition Efficiency, Camila Munoz, Radhouene Neji, Gastão Cruz, Andrew Mallia, Sami Jeljeli, Andrew J. Reader, Rene M. Botnar, and Claudia Prieto 339
Published online 20 April 2017

Improved Dark Blood Late Gadolinium Enhancement (DB-LGE) Imaging Using an Optimized Joint Inversion Preparation and T₂ Magnetization Preparation, Tamer A. Basha, Maxine C. Tang, Connie Tsao, Cory M. Tschabrunn, Elad Anter, Warren J. Manning, and Reza Nezafat..... 351
Published online 5 April 2017

Regional Assessment of In Vivo Myocardial Stiffness Using 3D Magnetic Resonance Elastography in a Porcine Model of Myocardial Infarction, Shivaram P. Arunachalam, Arvin Arani, Francis Baffour, Joseph A. Rysavy, Phillip J. Rossman, Kevin J. Glaser, David S. Lake, Joshua D. Trzasko, Armando Manduca, Kiaran P. McGee, Richard L. Ehman, and Philip A. Araoz..... 361
Published online 5 April 2017

Free-Breathing Liver Fat Quantification Using a Multiecho 3D Stack-of-Radial Technique, Tess Armstrong, Isabel Dregely, Alto Stemmer, Fei Han, Yutaka Natsuaki, Kyunghyun Sung, and Holden H. Wu..... 370
Published online 16 April 2017; notable corrections published online 12 June 2017, 11 July 2017, 31 July 2017

A Single-Shot T₂ Mapping Protocol Based on Echo-Split Gradient-Spin-Echo Acquisition and Parametric Multiplexed Sensitivity Encoding Based on Projection Onto Convex Sets Reconstruction, Mei-Lan Chu, Hing-Chiu Chang, Koichi Oshio, and Nan-kuei Chen 383
Published online 7 May 2017

Notes
A Constrained Slice-Dependent Background Suppression Scheme for Simultaneous Multislice Pseudo-Continuous Arterial Spin Labeling, Xingfeng Shao, Yi Wang, Steen Moeller, and Danny J.J. Wang 394
Published online 15 February 2017

Wave-CAIPI for Highly Accelerated MP-RAGE Imaging, Daniel Polak, Kawin Setsompop, Stephen F. Cauley, Borjan A. Gagoski, Himanshu Bhat, Florian Maier, Peter Bachert, Lawrence L. Wald, and Berkin Bilgic 401
Published online 20 February 2017

Orthogonally Combined Motion- and Diffusion-Sensitized Driven Equilibrium (OC-MDSDE) Preparation for Vessel Signal Suppression in 3D Turbo Spin Echo Imaging of Peripheral Nerves in the Extremities, Barbara Cervantes, Jan S. Kirschke, Elizabeth Klupp, Hendrik Kooijman, Peter Börnert, Axel Haase, Ernst J. Rummeny, and Dimitrios C. Karampinos 407
Published online 5 March 2017

Coronary MR Angiography Using Image-Based Respiratory Motion Compensation With Inline Correction and Fixed Gating Efficiency, Markus Henningsson, Jouke Smink, Gerald van Ensbergen, and Rene Botnar 416
Published online 20 March 2017

Exploiting Multicompartment Effects in Triple-Echo Steady-State T₂ Mapping for Fat Fraction Quantification, Dian Liu, Andreas Steingoetter, Jelena Curcic, and Sebastian Kozerke 423
Published online 25 March 2017

Slice Profile Effects on nCPMG SS-FSE, Eric K. Gibbons, Patrick Le Roux, John M. Pauly, and Adam B. Kerr 430
Published online 31 March 2017

■ PRECLINICAL AND CLINICAL IMAGING

Full Papers
Pulmonary MRI Morphometry Modeling of Airspace Enlargement in Chronic Obstructive Pulmonary Disease and Alpha-1 Antitrypsin Deficiency, Alexei Ouriadov, Eric Lessard, Khadija Sheikh, and Grace Parraga, for the Canadian Respiratory Research Network 439
Published online 15 February 2017

CONTENTS

Whole-Body Adipose Tissue and Lean Muscle Volumes and Their Distribution across Gender and Age: MR-Derived Normative Values in a Normal-Weight Swiss Population, Erika J. Ulbrich, Daniel Nanz, Olof Dahlqvist Leinhard, Magda Marcon, and Michael A. Fischer..... 449
Published online 22 April 2017

MRI Reveals Therapeutical Efficacy of Stem Cells: An Experimental Study on the SOD1(G93A) Animal Model, Pietro Bontempi, Alice Busato, Roberta Bonafede, Lorenzo Schiaffino, Ilaria Scambi, Andrea Sbarbati, Raffaella Mariotti, and Pasquina Marzola..... 459
Published online 31 March 2017

■ BIOPHYSICS AND BASIC BIOMEDICAL RESEARCH

Full Papers

A Compact 0.5 T MR Elastography Device and Its Application for Studying Viscoelasticity Changes in Biological Tissues During Progressive Formalin Fixation, Jürgen Braun, Heiko Tzschätzsch, Clara Körting, Angela Ariza de Schellenberger, Marika Jenderka, Toni Drießle, Michael Ledwig, and Ingolf Sack 470
Published online 20 March 2017

Radiofrequency Heating Studies on Anesthetized Swine Using Fractionated Dipole Antennas at 10.5 T, Yiğitcan Eryaman, Russell L. Lagore, M. Arcan Ertürk, Lynn Utecht, Patrick Zhang, Angel Torrado-Carvajal, Esra Abaci Türk, Lance DelaBarre, Gregory J. Metzger, Gregor Adriany, Kâmil Uğurbil, and J. Thomas Vaughan 479
Published online 31 March 2017

The Effect of Realistic Geometries on the Susceptibility-Weighted MR Signal in White Matter, Tianyou Xu, Sean Foxley, Michiel Kleinnijenhuis, Way Cherng Chen, and Karla L. Miller..... 489
Published online 10 April 2017

Bone Volume-to-Total Volume Ratio Measured in Trabecular Bone by Single-Sided NMR Devices, Leonardo Brizi, Marco Barbieri, Fabio Baruffaldi, Villiam Bortolotti, Chiara Fersini, Huabing Liu, Marcel Nogueira d'Eurydice, Sergei Obruchkov, Fangrong Zong, Petrik Galvosas, and Paola Fantazzini 501
Published online 10 April 2017

Note

Investigating the Physiological Effects of 10.5 Tesla Static Field Exposure on Anesthetized Swine, Yiğitcan Eryaman, Patrick Zhang, Lynn Utecht, Kivanc Kose, Russell L. Lagore, Lance DelaBarre, Jeremy Kulesa, Lynn E. Eberly, Gregor Adriany, Tinen L. Iles, Paul A. Iazzo, J. Thomas Vaughan, and Kamil Uğurbil..... 511
Published online 25 March 2017

■ COMPUTER PROCESSING AND MODELING

Full Papers

A Novel Phase-Unwrapping Method Based on Pixel Clustering and Local Surface Fitting With Application to Dixon Water-Fat MRI, Junying Cheng, Yingjie Mei, Biaoshui Liu, Jijing Guan, Xiaoyun Liu, Ed X. Wu, Qianjin Feng, Wufan Chen, and Yanqiu Feng 515
Published online 1 March 2017

Modeling Real Shim Fields for Very High Degree (and Order) B_0 Shimming of the Human Brain at 9.4 T, Paul Chang, Sahar Nassirpour, and Anke Henning..... 529
Published online 20 March 2017; notable correction published online 31 July 2017

Three-Dimensional Quantification of Vorticity and Helicity From 3D Cine PC-MRI Using Finite-Element Interpolations, Julio Sotelo, Jesús Urbina, Israel Valverde, Joaquín Mura, Cristián Tejos, Pablo Irarrazaval, Marcelo E. Andia, Daniel E. Hurtado, and Sergio Uribe..... 541
Published online 31 March 2017

Notes

Improving Left Ventricular Segmentation in Four-Dimensional Flow MRI Using Intramodality Image Registration for Cardiac Blood Flow Analysis, Vikas Gupta, Mariana Bustamante, Alexandru Fredriksson, Carl-Johan Carlhäll, and Tino Ebbers 554
Published online 16 March 2017

Parameter Estimation Using Weighted Total Least Squares in the Two-Compartment Exchange Model, Anders Garpebring and Tommy Löfstedt..... 561
Published online 27 March 2017

■ HARDWARE AND INSTRUMENTATION

Full Paper

In Vitro and In Silico Assessment of RF-Induced Heating Around Intracranial Aneurysm Clips at 7 Tesla, Yacine Nouredine, Oliver Kraff, Mark E. Ladd, Karsten H. Wrede, Bixia Chen, Harald H. Quick, Gregor Schaefers, and Andreas K. Bitz 568
Published online 7 March 2017

Notes

A 2-in-1 Single-Element Coil Design for Transcranial Magnetic Stimulation and Magnetic Resonance Imaging, Hai Lu and Shumin Wang 582
Published online 10 February 2017

In Vivo MRI of the Human Finger at 7 T, Elmar Laistler, Barbara Dymerska, Jürgen Sieg, Sigrun Goluch, Roberta Frass-Kriegel, Andre Kuehne, and Ewald Moser 588
Published online 10 March 2017

CONTENTS

Improved Fat Suppression of the Breast Using Discretized Frequency Shimming, Tijl A. van der Velden, Peter R. Lujten, and Dennis W.J. Klomp ... 593
Published online 28 February 2017

A Pneumatic Phantom for Mimicking Respiration-Induced Artifacts in Spinal MRI, Philippe De Tillieux, Ryan Topfer, Alexandru Foias, Iris Leroux, Imanne El Maâchi, Hugues Leblond, Nikola Stikov, and Julien Cohen-Adad..... 600
Published online 20 March 2017