

Journal publications

Selected publications on physically-informed correction of artifacts and biophysical modeling of quantitative MRI that are relevant for the proposed project:

1. Weiskopf N, Callaghan M, Josephs O, Lutti A, **Mohammadi S** (2014) Estimating the apparent transverse relaxation time ($R2^*$) from images with different contrasts (ESTATICS) reduces motion artifacts. *Brain Imaging Methods* 8:278, doi: [10.3389/fnins.2014.00278](https://doi.org/10.3389/fnins.2014.00278). (2 citations; *Novel method to simultaneously correct for motion artifacts and increase SNR during $R2^*$ estimation, w/o PhD supervisor*). [OA]
2. Callaghan M, Gunther H, Lutti A, **Mohammadi S**, Weiskopf N (in press) A general linear relaxometry model of $R1$ using imaging data. *Magn Reson Med*, doi: [10.1002/mrm.25210](https://doi.org/10.1002/mrm.25210). (*Demonstration of a linear relation between quantitative MRI measures and micro-scale white matter compartments, which is general over healthy subjects and thus might become an important method for detecting pathologic conditions, w/o PhD supervisor*). [OA]
3. **Mohammadi S**, Hutton C, Nagy Z, Josephs O, Weiskopf N (2013), Retrospective correction of physiological noise in DTI using an extended tensor model and peripheral measurements. *Magn Reson Med* 70(2): 358-69, doi: [10.1002/mrm.24467](https://doi.org/10.1002/mrm.24467). (8 citations; *First principled generative model of physiology in diffusion MRI; funded by DFG, w/o PhD supervisor*). [OA]
4. **Mohammadi S**, Freund P, Feiweier T, Curt A, Weiskopf N (2013a) The impact of post-processing on spinal cord diffusion tensor imaging. *Neuroimage* 70:377–385, doi: [10.1016/j.neuroimage.2012.12.058](https://doi.org/10.1016/j.neuroimage.2012.12.058). (12 citations; *Importance of ACID-toolbox artifact corrections for advanced diffusion MRI; currently used in clinical study; funded by DFG, w/o PhD supervisor*). [OA]
5. **Mohammadi S**, Nagy Z, Hutton C, Josephs O, Weiskopf N (2012) Correction of vibration artifacts in DTI using phase-encoding reversal (COVIPER), doi:[10.1002/mrm.23308](https://doi.org/10.1002/mrm.23308). *Magn Reson Med* 68:882–889. (12 citations; *Addressing major hardware and physiology artifacts; funded by DFG, w/o PhD supervisor*). [OA]
6. **Mohammadi S**, Nagy Z, Möller HE, Symms MR, Carmichael DW, Josephs O, Weiskopf N (2012a) The effect of local perturbation fields on human DTI: characterisation, measurement and correction. *Neuroimage* 60:562–570, doi:[10.1016/j.neuroimage.2011.12.009](https://doi.org/10.1016/j.neuroimage.2011.12.009). (13 citations; *Addressing major hardware artifact, associated with the next generation of scanners, e.g. the 7T scanner that is to be used in the Grant, w/o PhD supervisor*). [OA]
7. **Mohammadi S**, Möller HE, Kugel H, Müller DK, Deppe M (2010) Correcting eddy current and motion effects by affine whole-brain registrations: evaluation of three-dimensional distortions and comparison with slice-wise correction. *Magn Reson Med* 64:1047–1056, doi:[10.1002/mrm.22501](https://doi.org/10.1002/mrm.22501). (39 citations; *Improved inter-subject comparability; Important for group studies, especially for clinical research*).
8. Becker SMA (*), Tabelow K (*), **Mohammadi S**, Weiskopf N, Polzehl J (2014) Adaptive smoothing of multi-shell diffusion weighted magnetic resonance data by msPOAS. *NeuroImage* 95:90–105, doi: [10.1016/j.neuroimage.2014.03.053](https://doi.org/10.1016/j.neuroimage.2014.03.053). (5 citations; *Novel adaptive denoising method for diffusion MRI data; Important for high-resolution dMRI*). [OA]
9. Ruthotto L, **Mohammadi S**, Weiskopf N (2014) A new method for joint susceptibility artefact correction and super-resolution for dMRI. *Proc. SPIE* 9034, Medical Imaging 2014: Image Processing, <http://dx.doi.org/10.1117/12>. (*Novel super-resolution approach for diffusion MRI; An important step towards mesoscopic diffusion MRI*). [OA]
10. Tabelow K (*), **Mohammadi S** (*), Weiskopf N, Polzehl J (2014) POAS4SPM: A Toolbox for SPM to Denoise Diffusion MRI Data. *Neuroinformatics*, doi: [10.1007/s12021-014-9228-3](https://doi.org/10.1007/s12021-014-9228-3). (*Novel toolbox for adaptive denoising of dMRI data for SPM; Important for in-vivo and ex-vivo high-resolution dMRI*). [OA]
11. **Mohammadi S**, Tabelow K, Ruthotto L, Feiweier T, Polzehl J, Weiskopf N (2014) High-resolution diffusion kurtosis imaging at 3T enabled by advanced post-processing. *Brain Imaging Methods* 8:427, doi: doi: [10.3389/fnins.2014.00427](https://doi.org/10.3389/fnins.2014.00427). (*Novel method for acquiring and estimating high-fidelity high-resolution Diffusion Kurtosis Imaging data; Important step towards advanced biophysical models*). [OA]

12. Helbling S, Teki S, Callaghan MF., Sedley W, **Mohammadi S**, Griffiths TD, Weiskopf N, Barnes GR (2015), Structure predicts function: Combining non-invasive electrophysiology with in-vivo histology, *NeuroImage* 108:377-385, doi: [10.1016/j.neuroimage.2014.12.030](https://doi.org/10.1016/j.neuroimage.2014.12.030). (*An approach for combining high resolution MRI-based myelin mapping with functional information from EEG or MEG; Important step towards explore structure–function relationships within the brain*). [OA]
13. N Weiskopf, **S Mohammadi**, A Lutti, MF Callaghan (accepted), Advances in MRI-based computational neuroanatomy: from morphometry to in-vivo histology *Curr Opin Neurol*. (*Review that relates the concept of “in-vivo histology” via MRI to other computational neuroanatomy approaches - first review article about in-vivo histology*).

(*) Shared first authors

3 most important contributions to the field of diffusion MRI:

14. **Mohammadi S**, Keller SS, Glauche V, Kugel H, Jansen A, Hutton C, Flöel A, Deppe M (2012) The Influence of Spatial Registration on Detection of Cerebral Asymmetries Using Voxel-Based Statistics of Fractional Anisotropy Images and TBSS, doi:[10.1002/mrm.23308](https://doi.org/10.1002/mrm.23308). *PloS One* 7:e36851. (*16 citations; First study that compared different registration methods for DTI-based group studies*). [OA]
15. Meinzer M (*) / **Mohammadi S** (*), Kugel H, Schiffbauer H, Flöel A, Albers J, Kramer K, Menke R, Baumgärtner A, Knecht S, Breitenstein C, Deppe M (2010) Integrity of the hippocampus and surrounding white matter is correlated with language training success in aphasia. *NeuroImage* 53:283–290, doi:[10.1016/j.neuroimage.2010.06.004](https://doi.org/10.1016/j.neuroimage.2010.06.004). (*34 citations; This study demonstrates that microstructural changes from DTI can predict functional performance in stroke*).
16. Kleffner I, Deppe M, **Mohammadi S**, Schiffbauer H, Stupp N, Lohmann H, Young P, Ringelstein EB (2008) Diffusion tensor imaging demonstrates fiber impairment in Susac syndrome. *Neurology* 70:1867–1869, doi:[10.1212/01.wnl.0000280580.95671.01](https://doi.org/10.1212/01.wnl.0000280580.95671.01). (*30 citations; Today, the demonstrated DTI symptom pattern is used in the clinical routine to diagnose the Susac syndrome*).

(*) Shared first authors

Other publications:

17. Reilmann R, Holtbernd F, Bachmann R, **Mohammadi S**, Ringelstein EB, Deppe M (2013) Grasping multiple sclerosis: do quantitative motor assessments provide a link between structure and function? *J Neurol* 260:407–414, doi:[10.1007/s00415-012-6639-7](https://doi.org/10.1007/s00415-012-6639-7).
18. Stubbe-Dräger B Md, Deppe M Phd, Mohammadia S Phd, Keller SS Phd, Kugel H Phd, Gregor N Md, Evers S Md, Young P Md, Ringelstein E-B Md, Arendt G Md, Knecht S Md, Husstedt IW Md (2012) Early microstructural white matter changes in patients with HIV: a diffusion tensor imaging study. *BMC Neurol* 12:23, doi:[10.1186/1471-2377-12-23](https://doi.org/10.1186/1471-2377-12-23). [OA]
19. Gerdes JS, Keller SS, Schwindt W, Evers S, **Mohammadi S**, and Deppe M (2012), “Progression of microstructural putamen alterations in a case of symptomatic recurrent seizures using diffusion tensor imaging,” *Seizure* 21 (6): 478–481, doi:[10.1016/j.seizure.2012.03.015](https://doi.org/10.1016/j.seizure.2012.03.015). [OA]
20. Keller SS, Gerdes JS, **Mohammadi S**, Kellinghaus C, Kugel H, Deppe K, Ringelstein EB, Evers S, Schwindt W, Deppe M (2012) Volume Estimation of the Thalamus Using Freesurfer and Stereology: Consistency between Methods. *Neuroinformatics* 10:341–350, doi:[10.1007/s12021-012-9147-0](https://doi.org/10.1007/s12021-012-9147-0). [OA]
21. Keller SS, Ahrens T, **Mohammadi S**, Gerdes JS, Möddel G, Kellinghaus C, Kugel H, Weber B, Ringelstein EB, Deppe M (2013) Voxel-Based Statistical Analysis of Fractional Anisotropy and Mean Diffusivity in Patients with Unilateral Temporal Lobe Epilepsy of Unknown Cause. *J Neuroimaging* 23:352–359, doi:[10.1111/j.1552-6569.2011.00673](https://doi.org/10.1111/j.1552-6569.2011.00673). [OA]
22. Duning T, Schiffbauer H, Warnecke T, **Mohammadi S**, Floel A, Kolpatzik K, Kugel H, Schneider A, Knecht S, Deppe M, Schabitz WR (2011) G-CSF Prevents the Progression of Structural Disintegration of

White Matter Tracts in Amyotrophic Lateral Sclerosis: A Pilot Trial. PLoS ONE 6(3): e17770. [doi:10.1371/journal.pone.0017770](https://doi.org/10.1371/journal.pone.0017770).

23. Keller SS, Ahrens T, **Mohammadi S**, Möddel G, Kugel H, Ringelstein EB, Deppe M (2011), Microstructural and volumetric abnormalities of the putamen in juvenile myoclonic epilepsy. *Epilepsia*, 52: 1715–1724. [doi:10.1111/j.1528-1167.2011.03117.x](https://doi.org/10.1111/j.1528-1167.2011.03117.x).
24. Mueller K, Anwander A, Moller HE, Horstmann A, Lepsien J, Busse F, **Mohammadi S**, Schroeter ML, Stumvoll M, Villringer A, Pleger B (2011) Sex-Dependent Influences of Obesity on Cerebral White Matter Investigated by Diffusion-Tensor Imaging. PLoS ONE 6(4): e18544. [doi:10.1371/journal.pone.0018544](https://doi.org/10.1371/journal.pone.0018544). [OA]
25. Duning T, Kellinghaus C, **Mohammadi S**, Schiffbauer H, Keller S, Ringelstein EB, Knecht S, Deppe M (2010a) Individual white matter fractional anisotropy analysis on patients with MRI negative partial epilepsy. *J Neurol Neurosurg Psychiatry* 81: 136-139, [doi:10.1136/jnnp.2008.160820](https://doi.org/10.1136/jnnp.2008.160820).
26. Duning T, Warnecke T, Schirmacher A, Schiffbauer H, Lohmann H, **Mohammadi S**, Young P, Deppe M (2010b) Specific pattern of early white-matter changes in pure hereditary spastic paraplegia. *Mov Disord* 25: 1986-1992, [doi:10.1002/mds.23211](https://doi.org/10.1002/mds.23211).
27. Keller SS, Roberts N, Garcia-Finana M, **Mohammadi S**, Ringelstein EB, Knecht S, Deppe M (2010) Can the Language-dominant Hemisphere Be Predicted by Brain Anatomy? *J Cogn Neurosci*, [doi:10.1162/jocn.2010.21563](https://doi.org/10.1162/jocn.2010.21563).
28. Kleffner I, Deppe M, **Mohammadi S**, Schwindt W, Sommer J, Young P, Ringelstein EB (2010) Neuroimaging in Susac's syndrome: focus on DTI. *J Neurol Sci* 299: 92-96, [doi:10.1016/j.jns.2010.08.028](https://doi.org/10.1016/j.jns.2010.08.028).
29. Warnecke T, Duning T, Schirmacher A, **Mohammadi S**, Schwindt W, Lohmann H, Dziewas R, Deppe M, Ringelstein EB, Young P (2010) A novel splice site mutation in the SPG7 gene causing widespread fiber damage in homozygous and heterozygous subjects. *Mov Disord* 25: 413-420, [doi:10.1002/mds.22949](https://doi.org/10.1002/mds.22949).
30. Wersching H, Duning T, Lohmann H, **Mohammadi S**, Stehling C, Fobker M, Conty M, Minnerup J, Ringelstein EB, Berger K, Deppe M, Knecht S (2010) Serum C-reactive protein is linked to cerebral microstructural integrity and cognitive function. *Neurology* 74: 1022-1029, [doi:10.1212/WNL.0b013e3181d7b45b](https://doi.org/10.1212/WNL.0b013e3181d7b45b).
31. Duning T, Warnecke T, **Mohammadi S**, Lohmann H, Schiffbauer H, Kugel H, Knecht S, Ringelstein EB, Deppe M (2009) Pattern and progression of white-matter changes in a case of posterior cortical atrophy using diffusion tensor imaging. *J Neurol Neurosurg Psychiatry* 80 (4): 432-6, [doi:10.1136/jnnp.2008.153148](https://doi.org/10.1136/jnnp.2008.153148).
32. Duning T, Deppe M, Keller S, **Mohammadi S**, Schiffbauer H, Marziniak M (2009) Diffusion tensor imaging in a case of Kearns-Sayre syndrome: Striking brainstem involvement as a possible cause of oculomotor symptoms. *J Neurol Sci* 80: 432-436, [doi:10.1136/jnnp.2008.153148](https://doi.org/10.1136/jnnp.2008.153148).
33. Kovac S, Deppe M, **Mohammadi S**, Schiffbauer H, Schwindt W, Möddel G, Dogan M, Evers S (2009) Gelastic seizures: a case of lateral frontal lobe epilepsy and review of the literature. *Epilepsy Behav* 15 (2): 249-253, [doi:10.1016/j.yebeh.2009.03.004](https://doi.org/10.1016/j.yebeh.2009.03.004).
34. Anneken K, Evers S, **Mohammadi S**, Schwindt W, Deppe M (2008) Transient lesion in the splenium related to antiepileptic drug: Case report and new pathophysiological insights. *Seizure* 17 (7): 654-657, [doi:10.1016/j.seizure.2008.01.004](https://doi.org/10.1016/j.seizure.2008.01.004).
35. Deppe M, Kellinghaus C, Duning T, Möddel G, **Mohammadi S**, Deppe K, Schiffbauer H, Kugel H, Keller SS, Ringelstein EB, Knecht S (2008) Nerve fiber impairment of anterior thalamocortical circuitry in juvenile myoclonic epilepsy. *Neurology* 71 (24): 1981-1985, [doi:10.1212/01.wnl.0000336969.98241.17](https://doi.org/10.1212/01.wnl.0000336969.98241.17).
36. Deppe M, Duning T, **Mohammadi S**, Schwindt W, Kugel H, Knecht S, Ringelstein EB (2007) Diffusion-Tensor Imaging at 3 T: Detection of White Matter Alterations in Neurological Patients on the Basis of Normal Values. *Invest Radiol* 42 (6): 338-345, [doi:10.1097/01.rli.0000261935.41188.39](https://doi.org/10.1097/01.rli.0000261935.41188.39).
37. Jansen A, Deppe M, Schwindt W, **Mohammadi S**, Sehlmeier C, Knecht S (2006) Interhemispheric dissociation of language regions in a healthy subject. *Arch Neurol* 63 (9): 1344-6, [doi:10.1001/archneur.63.9.1344](https://doi.org/10.1001/archneur.63.9.1344).

38. Struck A, **Mohammadi S**, Kettemann S, Brandes T, Kramer B (2005) Interaction-driven g-factor enhancement in clean parabolical wires. Phys. Rev. B 2005, 72: 245317, [doi:10.1103/PhysRevB.72.245317](https://doi.org/10.1103/PhysRevB.72.245317).

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Important Conference Proceedings

1. **Mohammadi S**, Carey D, Dick F, Diedrichsen J, Callaghan MF, Sereno M, Reisert M, Weiskopf N (2015) Population maps of axonal MRI g-ratio, Proceedings of the 21st Human Brain Mapping meeting, Hawaii, Honolulu 2015: 4102, (*oral presentation*).
2. **Mohammadi S**, Carey D, Dick F, Diedrichsen J, Callaghan MF, Sereno M, Reisert M, Weiskopf N (2015) Whole-brain in-vivo measurements of the axonal g-ratio in a group of 19 healthy volunteers, 23rd Annual Meeting ISMRM, Toronto, Ontario, Canada, 2015, Abstract: 0004 (*oral presentation, ISMRM merit award: summa cum laude*).
3. **Mohammadi S**, Tabelow K, Polzehl J, Weiskopf N (2013) High-resolution diffusion kurtosis imaging (DKI) enabled by segmented position orientation adaptive smoothing (POAS). 21st Annual Meeting ISMRM, Salt Lake City, Utah, 2013 Abstract 3131.
4. Ruthotto L., **Mohammadi S**, Weiskopf N, Modersitzki J: DISCO - Diffeomorphic Susceptibility Correction of MRI in SPM. Bildverarbeitung für die Medizin, Heidelberg, 2013 (*oral presentation*).
5. **Mohammadi S**, Nagy Z, Hutton C, Josephs O, Weiskopf N (2012) Correction of vibration artefacts in DTI using phase-encoding reversal (COVIPER). In: 20th Annual Meeting ISMRM, Melbourne, 2012 Abstract 1898 (*ISMRM merit award*).
6. **Mohammadi S**, Nagy Z, Josephs O, Weiskopf N (2011a) The vibration artifact in DTI: assessment and correction. Proceedings of the 17th Human Brain Mapping meeting, June 26-30, 2011, Quebec City, Neuroimage 49, Abstract: 602.
7. **Mohammadi S**, Deppe M, Möller HE (2010a) Scaling in readout direction: a vibration-induced distortion of diffusion-weighted images and its retrospective correction by affine registration. In: Proc 18th Annual Meeting ISMRM, Stockholm, 2010 Abstract 3103.
8. **Mohammadi S**, Glauche V, Keller SS, Deppe M (2010b) The influence of the registration on voxel-based statistics of fractional anisotropy images: using detected white matter degenerations associated with juvenile myoclonic epilepsy as a gold standard. In: Proc 18th Annual Meeting ISMRM, Stockholm, 2010 Abstract 1557.
9. **Mohammadi S**, Floel A, Glauche V, Schwindt W, Deppe M (2009a) Comparing VBM-style voxel-based statistics of FA images and TBSS for the detection of hemispheric asymmetries. Proceedings of the 15th Human Brain Mapping meeting, June 18-23, 2009, San Fransisco, Neuroimage 47: S128.
10. **Mohammadi S**, Glauche V, Deppe M (2009b) SPM normalization toolbox for voxel-based statistics on fractional anisotropy images. Proceedings of the 15th Human Brain Mapping meeting, June 18-23, 2009, San Fransisco, Neuroimage 47: S122.
11. **Mohammadi S**, Jansen A, Schwindt W, Knecht S, Deppe M (2007a) Identifying anatomical correlates of right-hemispheric language processing: A diffusion tensor imaging study. Proceedings of the 13th Human Brain Mapping meeting, June 10-14, 2007, Chicago, Neuroimage 36: S37 (*oral presentation*).

Book Chapters

1. Kleffner I, Deppe M., **Mohammadi S**, Van Damme P, Sunaert S, Schwindt W, Sommer J, Young P, Ringelstein E Diffusion Tensor Imaging Is More Sensitive than Conventional Magnetic Resonance Imaging in Demonstrating White Matter Abnormalities in Susac's Syndrome. In: T.B.Westland R.N.C., Editor. Handbook on White Matter. Nova Science Publishers, Inc, 2009: 299-316.
2. Freund P, **Mohammadi S**, Weiskopf N, and Curt A Spinal Cord Disorders: tracking structural changes using neuroimaging. In: Oxford Textbook of Neuroimaging / 9780199664092. Oxford University Press, (*accepted*).