

MATTHIAS MORZFELD, LIST OF PUBLICATIONS

JOURNAL PUBLICATIONS

1. M. Morzfeld, D. Hodyss, *A theory for why even simple covariance localization is so useful in ensemble data assimilation*, Monthly Weather Review 151(3), 717-736 (2023).
2. D. Hodyss, M. Morzfeld, *How sampling errors in covariance estimates cause bias in the Kalman gain and impact ensemble data assimilation*, Monthly Weather Review 151(9), 2413-2426 (2023).
3. X.T. Tong, M. Morzfeld, *Localized ensemble Kalman inversion*, Inverse Problems 39 064002 (2023).
4. E.J. Vavra, H. Qiu, B. Chi, P.-E. Share, A. Allam, M. Morzfeld, F. Vernon, Y. Ben-Zion, Y. Fialko. (2023). Active dipping interface of the Southern San Andreas fault revealed by space geodetic and seismic imaging. Journal of Geophysical Research: Solid Earth, 128, e2023JB026811.
5. B.J. Cych, M. Morzfeld, D. Heslop, S.M. Maher, J.S. Gee, Lisa Tauxe, *Thermal Resolution of Unblocking Temperatures (TROUT): A method for “unmixing” multi-component magnetizations*, Geochemistry, Geophysics, Geosystems, 24, e2023GC010920 (2023).
6. D. Blatter, M. Morzfeld, K. Key, S. Constable, *Uncertainty quantification for regularized inversion of electromagnetic geophysical data—Part I: motivation and theory*, Geophysical Journal International, 231(2), 1057–1074 (2022).
7. D. Blatter, M. Morzfeld, K. Key, S. Constable, *Uncertainty quantification for regularized inversion of electromagnetic geophysical data – Part II: application in 1-D and 2-D problems*, Geophysical Journal International, 231(2), 1075–1095 (2022).
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11. S. Swierczek, M.R. Mazloff, M. Morzfeld, J.L. Russell, *The effect of resolution on vertical heat and carbon transports in a regional ocean circulation model of the Argentine Basin*, Journal of Geophysical Research: Oceans, 126(7), e2021JC017235 (2021).
12. S. Lunderman, M. Morzfeld, D.J. Posselt, *Using global Bayesian optimization in ensemble data assimilation: parameter estimation, tuning localization and inflation, or all of the above*, Tellus A: Dynamic Meteorology and Oceanography, 73(1), 1-16 (2021).
13. T. Harty, M. Morzfeld, C. Snyder, *Eigenvector-spatial localization*, Tellus A: Dynamic Meteorology and Oceanography 73(1), 1-18 (2021).

14. K. Gwirtz, M. Morzfeld, A. Fournier, G. Hulot, *Can one use Earth's magnetic axial dipole field intensity to predict reversals?*, *Geophysical Journal International* 225(1), 277-297 (2021). *Geophysical Journal International Student Author Award*.
15. J. Adams, J. Pillow, K. Joyce, M. Brennan, M.I. Español, M. Morzfeld, S. Breckling, D. Champion, E. Clarkson, R. Coffee, A. Gehring, M. Lund, D. Smalley, A. Williams, J. Zier, D. Frayer, M. Howard, E. Machorro, *An approach to characterizing spatial aspects of image system blur*, *Statistical Analysis and Data Mining: The ASA Data Science Journal*, 1-13 (2021).
16. J. Adams, M. Morzfeld, K. Joyce, M. Howard, A. Luttmann, *A blocking scheme for dimension-robust Gibbs sampling in large-scale image deblurring*, *Inverse Problems in Science and Engineering*, 1-22 (2021).
17. X.T. Tong, M. Morzfeld and Y.M. Marzouk, *MALA-within-Gibbs samplers for high-dimensional distributions with sparse conditional structure*, *SIAM Journal of Scientific Computing*, 42(3), A1765–A1788 (2020).
18. S. Lunderman, M. Morzfeld, F. Glassmeier and G. Feingold, *Estimating parameters of the non-linear cloud and rain equation from a large-eddy simulation*, *Physica D*, 410, 123500 (2020).
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20. M. Morzfeld and D. Hodyss, *Gaussian approximations in filters and smoothers for data assimilation*, *Tellus A: Dynamic Meteorology and Oceanography*, 71:1, 1-27 (2019).
21. M. Morzfeld, X.T. Tong and Y.M. Marzouk, *Localization for MCMC: sampling high-dimensional posterior distributions with local structure*, *Journal of Computational Physics*, 380, 1–28 (2019).
22. M. Morzfeld and B.A. Buffett, *A comprehensive model for the kyr and Myr time scales of Earth's axial magnetic dipole field*, *Nonlinear Processes in Geophysics*, 26, 123-142 (2019).
23. J.B. Bell, M.S. Day, J. Goodman, R.W. Grout and M. Morzfeld, *A Bayesian approach to calibrating hydrogen flame kinetics using many experiments and parameters*, *Combustion and Flame* 205, 305–315 (2019).
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27. M. Morzfeld, M.S. Day, R.W. Grout, G.S.H. Pau, S.A. Finsterle, and J.B. Bell, *Iterative Importance Sampling Algorithms for Parameter Estimation*, *SIAM Journal on Scientific Computing* 40:2, B329-B352 (2018).
28. A. Leach, K.K. Lin, M. Morzfeld, *Symmetrized importance samplers for stochastic differential equations*, *Communications in Applied Mathematics and Computational Science* 13 (2), 215–241 (2018).

29. D.T. Kawano, R.G. Salsa Jr., F. Ma, and M. Morzfeld, *A canonical form of the equation of motion of linear dynamical systems*, Proceedings of the Royal Society A 474: 20170809 (2018).
30. M. Morzfeld, D. Hodyss, and C. Snyder *What the collapse of the ensemble Kalman filter tells us about particle filters*, Tellus A: Dynamic Meteorology and Oceanography, 69:1, 1283809 (2017).
31. M. Morzfeld, A. Fournier, G. Hulot, *Coarse predictions of dipole reversals by low-dimensional modeling and data assimilation*, Physics of Earth and Planetary Interiors **262**, 8–27 (2017).
32. A.T. Lorenzo, M. Morzfeld, W.F. Holmgren, A. Cronin, *Optimal interpolation of satellite and ground data for irradiance nowcasting at city scales*, Solar Energy **144**, 466–474 (2017).
33. D. Hodyss, C.H. Bishop, and M. Morzfeld, *To what extent is your data assimilation scheme designed to find the posterior mean, the posterior mode or something else?*, Tellus A: Dynamic Meteorology and Oceanography, 68:1, 30625 (2016).
34. A.J. Chorin, F. Lu, R.N. Miller, M. Morzfeld, and X. Tu, *Sampling, feasibility, and priors in data assimilation*, Discrete and Continuous Dynamical Systems **36**(8), special issue dedicated to Peter D. Lax on the occasion of his ninetieth birthday, (2016).
35. M. Morzfeld, *Implicit sampling for path integral control, localization, and SLAM*, ASME Journal of Dynamical Systems, Measurement and Control **137**, 051016-1 – 051016-14 (2015).
36. M. Morzfeld, X. Tu, J. Wilkening, and A.J. Chorin *Implicit sampling for parameter estimation*, Communications in Applied Mathematics and Computational Science **10**(2), 205–225 (2015).
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38. J. Goodman, K.K. Lin, and M. Morzfeld, *Small-noise analysis and symmetrization of implicit Monte Carlo samplers*, Communications on Pure and Applied Mathematics, doi: 10.1002/cpa.21592 (2015).
39. F. Lu, M. Morzfeld, X. Tu, and A.J. Chorin, *Limitations of polynomial chaos expansions in the Bayesian solution of inverse problems*, Journal of Computational Physics **282** 138–147 (2015).
40. A.J. Chorin and M. Morzfeld, *Conditions for successful data assimilation*, Journal of Geophysical Research: Atmospheres **118**(20), 11522–11533 (2013).
41. E. Atkins, M. Morzfeld, X. Tu, and A.J. Chorin, *Implicit particle methods and their connection with variational data assimilation*, Monthly Weather Review **141**, 1786–1803 (2013).
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43. M. Morzfeld, D.T. Kawano, and F. Ma, *Characterization of damped linear dynamical systems in free motion*, Numerical Algebra, Control and Optimization **3**(1), 49–62 (2013).
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49. D.T. Kawano, M. Morzfeld, and F. Ma, *The decoupling of defective linear dynamical systems in free motion*, *Journal of Sound and Vibration* **330**(21), 5165–5183 (2011).
50. F. Ma and M. Morzfeld, *A general methodology for decoupling damped linear systems*, *Procedia Engineering* **14**, 2498–2502 (2011).
51. A.J. Chorin, M. Morzfeld, and X. Tu, *Implicit filters for data assimilation*, *Communication in Applied Mathematics and Computational Science* **5**, 221–240 (2010).
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53. F. Ma, A. Imam, and M. Morzfeld, *The decoupling of damped linear systems in oscillatory free vibration*, *Journal of Sound and Vibration* **324** (1-2), 408-428 (2009).
54. M. Morzfeld, N. Avajakom, and F. Ma, *Diagonal dominance of damping and the decoupling approximation in linear vibratory systems*, *Journal of Sound and Vibration* **320**(1-2), 406–420 (2009).
55. M. Morzfeld, N. Avajakom, and F. Ma, *On the decoupling approximation in damped linear systems*, *Journal of Vibration and Control*, **14** (12), 1869–1884 (2008).
56. M. Morzfeld, N. Avajakom, and F. Ma, *A remark about the decoupling approximation in damped discrete linear systems*, *Mechanics Research Communications* **35**, 439–446 (2008).

REPORTS

1. E. Satterfield et al., *NRL Atmospheric Data Assimilation and ONR Code 31: Workshop Proceedings*, NRL/Code/FR–2021, 2021.

BOOK CHAPTERS

1. A.J. Chorin, M. Morzfeld, and X. Tu, *Implicit sampling, with application to data assimilation*, in “Partial Differential Equations: Theory, Control and Approximation” (in honor of the scientific heritage of Jacques-Louis Lions), P.G. Ciarlet, T. Li and Y. Maday (editors), Springer, 2014.
2. A.J. Chorin, M. Morzfeld, and X. Tu, *A survey of implicit particle filters for data assimilation*, in “State Space Models, with Applications in Economics and Finance” Y. Zeng and S. Wu (editors), Springer, 2013.