

LIST OF PUBLICATIONS

LASSI ROININEN

Date of the publication list: August 30, 2024

A Peer-reviewed scientific articles

Journal articles

- [1] Lassi Roininen, Markku S. Lehtinen, Sari Lasanen, Mikko Orispää, and Markku Markkanen. “Correlation priors”. In: *Inverse Problems and Imaging* 5.1 (2011), pp. 167–184. ISSN: 1930-8337. DOI: 10.3934/ipi.2011.5.167. URL: <http://aimsciences.org/journals/displayArticlesnew.jsp?paperID=5929>.
- [2] Lassi Roininen, Petteri Piiroinen, and Markku Lehtinen. “Constructing continuous stationary covariances as limits of the second-order stochastic difference equations”. In: *Inverse Problems and Imaging* 7.2 (2013), pp. 611–647. ISSN: 1930-8337. DOI: 10.3934/ipi.2013.7.611. URL: <http://aimsciences.org/journals/displayArticlesnew.jsp?paperID=8646>.
- [3] Lassi Roininen and Markku S. Lehtinen. “Perfect pulse-compression coding via ARMA algorithms and unimodular transfer functions”. In: *Inverse Problems and Imaging* 7.2 (2013), pp. 649–661. ISSN: 1930-8337. DOI: 10.3934/ipi.2013.7.649. URL: <http://aimsciences.org/journals/displayArticlesnew.jsp?paperID=8647>.
- [4] Ilkka I. Virtanen, Frank D. Lind, Lassi Roininen, Philip J. Erickson, William C. Rideout, Mikko Orispää, Juha Vierinen, and Markku S. Lehtinen. “Polyphase-coded incoherent scatter measurements at Millstone Hill”. In: *Radio Science* 48.5 (2013), pp. 519–526. ISSN: 1944-799X. DOI: 10.1002/rds.20058. URL: <http://dx.doi.org/10.1002/rds.20058>.
- [5] Antti Kero, Juha Vierinen, Derek McKay-Bukowski, Carl-Fredrik Enell, Malefia Sinor, Lassi Roininen, and Yasunobu Ogawa. “Ionospheric electron density profiles inverted from a spectral riometer measurement”. In: *Geophysical Research Letters* 41.15 (2014), pp. 5370–5375. ISSN: 1944-8007. DOI: 10.1002/2014GL060986. URL: <http://dx.doi.org/10.1002/2014GL060986>.
- [6] Lassi Roininen, Janne M. J. Huttunen, and Sari Lasanen. “Whittle-Matérn priors for Bayesian statistical inversion with applications in electrical impedance tomography”. In: *Inverse Problems and Imaging* 8.2 (2014), pp. 561–586. ISSN: 1930-8337. DOI: 10.3934/ipi.2014.8.561. URL: <http://aimsciences.org/journals/displayArticlesnew.jsp?paperID=9912>.
- [7] Ilkka I. Virtanen, Derek McKay-Bukowski, Juha Vierinen, Anita Aikio, Richard Fallows, and Lassi Roininen. “Plasma parameter estimation from multistatic, multibeam incoherent scatter data”. In: *Journal of Geophysical Research: Space Physics* 119.12 (2014). 2014JA020540, pp. 10, 528–10, 543. ISSN: 2169-9402. DOI: 10.1002/2014JA020540. URL: <http://dx.doi.org/10.1002/2014JA020540>.

- [8] Richard A. Fallows, W. A. Coles, D. McKay-Bukowski, J. Vierinen, I. I. Virtanen, M. Postila, Th. Ulich, C-F. Enell, A. Kero, T. Iinatti, M. Lehtinen, M. Orispää, T. Raita, L. Roininen, E. Turunen, M. Brentjens, N. Ebbendorf, M. Gerbers, T. Grit, P. Gruppen, H. Meulman, M. J. Norden, J-P. de Reijer, A. Schoenmakers, and K. Stuurwold. “Broadband meter-wavelength observations of ionospheric scintillation”. In: *Journal of Geophysical Research: Space Physics* 119.12 (2014). 2014JA020406, pp. 10, 544–10, 560. ISSN: 2169-9402. DOI: 10.1002/2014JA020406. URL: <http://dx.doi.org/10.1002/2014JA020406>.
- [9] Lassi Roininen, Markku S. Lehtinen, Petteri Piironen, and Ilkka I. Virtanen. “Perfect radar pulse compression via unimodular fourier multipliers”. In: *Inverse Problems and Imaging* 8.3 (2014), pp. 831–844. ISSN: 1930-8337. DOI: 10.3934/ipi.2014.8.831. URL: <http://aimsciences.org/journals/displayArticlesnew.jsp?paperID=10286>.
- [10] Juha Vierinen, Johannes Norberg, Markku S. Lehtinen, Olaf Amm, Lassi Roininen, Antero Väänänen, Philip J. Erickson, and Derek McKay-Bukowski. “Beacon satellite receiver for ionospheric tomography”. In: *Radio Science* 49.12 (2014), pp. 1141–1152. ISSN: 1944-799X. DOI: 10.1002/2014RS005434. URL: <http://dx.doi.org/10.1002/2014RS005434>.
- [11] Johannes Norberg, Lassi Roininen, Juha Vierinen, Olaf Amm, Derek McKay-Bukowski, and Markku S. Lehtinen. “Ionospheric tomography in Bayesian framework with Gaussian Markov random field priors”. In: *Radio Science* 50.2 (2015). 2014RS005431, pp. 138–152. ISSN: 1944-799X. DOI: 10.1002/2014RS005431. URL: <http://dx.doi.org/10.1002/2014RS005431>.
- [12] Derek McKay-Bukowski, J. Vierinen, I.I. Virtanen, R. Fallows, M. Postila, T. Ulich, O. Wucknitz, M. Brentjens, N. Ebbendorf, C-F. Enell, M. Gerbers, T. Grit, P. Gruppen, A. Kero, T. Iinatti, M. Lehtinen, H. Meulman, M. Norden, M. Orispää, T. Raita, J.P. de Reijer, L. Roininen, A. Schoenmakers, K. Stuurwold, and E. Turunen. “KAIRA: The Kilpisjärvi Atmospheric Imaging Receiver Array—System Overview and First Results”. In: *IEEE Transactions on Geoscience and Remote Sensing* 53.3 (Mar. 2014), pp. 1440–1451. ISSN: 0196-2892. DOI: 10.1109/TGRS.2014.2342252.
- [13] Lassi Roininen, Marko Laine, and Thomas Ulich. “Time-varying ionosonde trend: Case study of Sodankylä hmF2 data 1957–2014”. In: *Journal of Geophysical Research: Space Physics* (2015). 2015JA021176. ISSN: 2169-9402. DOI: 10.1002/2015JA021176. URL: <http://dx.doi.org/10.1002/2015JA021176>.
- [14] Johannes Norberg, Ilkka I. Virtanen, Lassi Roininen, Juha Vierinen, Mikko Orispää, Kirsti Kauristie, and Markku S. Lehtinen. “Bayesian statistical ionospheric tomography improved by incorporating ionosonde measurements”. In: *Atmospheric Measurement Techniques* 9.4 (2016), pp. 1859–1869. DOI: 10.5194/amt-9-1859-2016. URL: <http://www.atmos-meas-tech.net/9/1859/2016/>.
- [15] Melessew Nigussie, Sandro Radicella, Baylie Damtie, Endawoke Yizengaw, Bruno Nava, and Lassi Roininen. “Validation of NeQuick TEC data ingestion technique against C/NOFS and EISCAT electron density measurements”. In: *Radio Science* 51.7 (2016). 2015RS005930, pp. 905–917. ISSN: 1944-799X. DOI: 10.1002/2015RS005930. URL: <http://dx.doi.org/10.1002/2015RS005930>.
- [16] Johannes Norberg, Lassi Roininen, Antti Kero, Tero Raita, Thomas Ulich, Markku Markkanen, Liisa Juusola, and Kirsti Kauristie. “Sodankylä ionospheric tomography data set 2003–2014”. In: *Geoscientific Instrumentation, Methods and Data Systems* 5.1 (2016), pp. 263–270. DOI: 10.5194/gi-5-263-2016. URL: <http://www.geosci-instrum-method-data-syst.net/5/263/2016/>.
- [17] A. Bires, L. Roininen, B. Damtie, M. Nigussie, and H. Vanhamäki. “Study of TEC fluctuation via stochastic models and Bayesian inversion”. In: *Radio Science* 51.11 (2016). 2016RS005959, pp. 1772–1782. ISSN: 1944-799X. DOI: 10.1002/2016RS005959. URL: <http://dx.doi.org/10.1002/2016RS005959>.

- [18] Lassi Roininen, Sari Lasanen, Mikko Orispää, and Simo Särkkä. “Sparse Approximations of Fractional Matérn Fields”. In: *Scandinavian Journal of Statistics* 45.1 (2018). 10.1111/sjos.12297, pp. 194–216. ISSN: 1467-9469. DOI: 10.1111/sjos.12297. URL: <http://dx.doi.org/10.1111/sjos.12297>.
- [19] Sari Lasanen, Lassi Roininen, and Janne M.J. Huttunen. “Elliptic boundary value problems with Gaussian white noise loads”. In: *Stochastic Processes and their Applications* 128.11 (2018), pp. 3607–3627. ISSN: 0304-4149. DOI: <https://doi.org/10.1016/j.spa.2017.11.007>. URL: <http://www.sciencedirect.com/science/article/pii/S0304414917302958>.
- [20] Abdu Mohammed Seid, Tesfahun Berhane, Lassi Roininen, and Melessew Nigussie. “Hierarchical Bayesian modeling of ionospheric TEC disturbances as non-stationary processes”. In: *Advances in Space Research* 61.5 (2018), pp. 1193–1205. ISSN: 0273-1177. DOI: <https://doi.org/10.1016/j.asr.2017.12.009>. URL: <http://www.sciencedirect.com/science/article/pii/S0273117717308852>.
- [21] Neil K Chada, Marco A Iglesias, Lassi Roininen, and Andrew M Stuart. “Parameterizations for ensemble Kalman inversion”. In: *Inverse Problems* 34.5 (2018), p. 055009. URL: <http://stacks.iop.org/0266-5611/34/i=5/a=055009>.
- [22] J. Norberg, J. Vierinen, L. Roininen, M. Orispää, K. Kauristie, W. C. Rideout, A. J. Coster, and M. S. Lehtinen. “Gaussian Markov Random Field Priors in Ionospheric 3-D Multi-Instrument Tomography”. In: *IEEE Transactions on Geoscience and Remote Sensing* (2018), pp. 1–13. ISSN: 0196-2892. DOI: 10.1109/TGRS.2018.2847026.
- [23] Lassi Roininen, Mark Girolami, Sari Lasanen, and Markku Markkanen. “Hyperpriors for Matérn fields with applications in Bayesian inversion”. In: *Inverse Problems & Imaging* 13 (2019), pp. 1–29. ISSN: 1930-8337. DOI: 10.3934/ipi.2019001. URL: <http://aims sciences.org//article/id/d17bde6b-3e5f-438d-af0a-b712cf433748>.
- [24] Markku Markkanen, Lassi Roininen, Janne M. J. Huttunen, and Sari Lasanen. “Cauchy difference priors for edge-preserving Bayesian inversion”. In: *Journal of Inverse and Ill-Posed Problems* 27.2 (2019), pp. 225–240. DOI: 10.1515/jiip-2017-0048.
- [25] Alberto Mendoza, Lassi Roininen, Mark Girolami, Jere Heikkinen, and Heikki Haario. “Statistical methods to enable practical on-site tomographic imaging of whole-core samples”. In: *Geophysics* (2019). DOI: 10.1190/geo2018-0436.1. URL: <https://doi.org/10.1190/geo2018-0436.1>.
- [26] Alberto Mendoza, Lassi Roininen, Mark Girolami, Jere Heikkinen, and Heikki Haario. “Accelerated Whole Core Analysis Optimization with Wellsite Tomographic Instrumentation and Bayesian Inversion”. In: *Petrophysics* 60.3 (2019).
- [27] Karla Monterrubio-Gómez, Lassi Roininen, Sara Wade, Theodoros Damoulas, and Mark Girolami. “Posterior inference for sparse hierarchical non-stationary models”. In: *Computational Statistics & Data Analysis* 148 (2020), p. 106954. ISSN: 0167-9473. DOI: <https://doi.org/10.1016/j.csda.2020.106954>. URL: <http://www.sciencedirect.com/science/article/pii/S0167947320300451>.
- [28] Kenneth Muhamuza, Janne M. J. Huttunen, Lassi Roininen, and Timo Lähivaara. “A Bayesian-based approach to improving acoustic Born waveform inversion of seismic data for viscoelastic media”. In: *Inverse Problems* (2020). URL: <http://iopscience.iop.org/10.1088/1361-6420/ab8f81>.
- [29] Teemu Häkkinen, Lassi Roininen, Matthew T. Moores, and Erik M. Vartiainen. “Bayesian Quantification for Coherent Anti-Stokes Raman Scattering Spectroscopy”. In: *The Journal of Physical Chemistry B* 0.ja (0). PMID: 32673491, null. DOI: 10.1021/acs.jpcb.0c04378. eprint: <https://doi.org/10.1021/acs.jpcb.0c04378>. URL: <https://doi.org/10.1021/acs.jpcb.0c04378>.

- [30] Jarkko Suuronen, Muhammad Emzir, Sari Lasanen, Simo Särkkä, and Lassi Roininen. “Enhancing industrial X-ray tomography by data-centric statistical methods”. In: *Data-Centric Engineering* 1 (2020), e10. DOI: [10.1017/dce.2020.10](https://doi.org/10.1017/dce.2020.10).
- [31] Muhammad Fuady Emzir, Sari J Lasanen, Zenith Purisha, Lassi Roininen, and Simo Särkkä. “Non-Stationary Multi-layered Gaussian Priors for Bayesian Inversion”. In: *Inverse Problems* (2020). URL: <http://iopscience.iop.org/article/10.1088/1361-6420/abc962>.
- [32] Ilkka I. Virtanen, Habtamu W. Tesfaw, Lassi Roininen, Sari Lasanen, and Anita Aikio. “Bayesian Filtering in Incoherent Scatter Plasma Parameter Fits”. In: *Journal of Geophysical Research: Space Physics* 126.3 (2021). e2020JA028700 2020JA028700, e2020JA028700. DOI: <https://doi.org/10.1029/2020JA028700>. eprint: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2020JA028700>. URL: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2020JA028700>.
- [33] Simo Särkkä, Lassi Roininen, Manon Kok, Roland Hostettler, and Andreas Hauptmann. “Guest Editorial: MLSP 2020 Special Issue”. In: *Journal of Signal Processing Systems* 94 (2022). DOI: <https://doi.org/10.1007/s11265-021-01738-z>.
- [34] Jarkko Suuronen, Neil K. Chada, and Lassi Roininen. “Cauchy Markov random field priors for Bayesian inversion”. In: *Statistics and Computing* 32 (2022). DOI: <https://doi.org/10.1007/s11222-022-10089-z>.
- [35] Dmitry Vladimirovich Gradov, Yusuf Oluwatoki Yusuf, Jussi Ojalainen, Jarkko Suuronen, Roope Eskola, Lassi Roininen, and Tuomas Koiranen. “Modelling of a continuous veneer drying unit of industrial scale and model-based ANOVA of the energy efficiency”. In: *Energy* 244 (2022), p. 122673. ISSN: 0360-5442. DOI: <https://doi.org/10.1016/j.energy.2021.122673>. URL: <https://www.sciencedirect.com/science/article/pii/S0360544221029224>.
- [36] S. Ross, A. Arjas, I. I. Virtanen, M. J. Sillanpää, L. Roininen, and A. Hauptmann. “Hierarchical deconvolution for incoherent scatter radar data”. In: *Atmospheric Measurement Techniques* 15.12 (2022), pp. 3843–3857. DOI: [10.5194/amt-15-3843-2022](https://doi.org/10.5194/amt-15-3843-2022). URL: <https://amt.copernicus.org/articles/15/3843/2022/>.
- [37] J. Norberg, S. Käki, L. Roininen, J. Mielich, and I. I. Virtanen. “Model-Free Approach for Regional Ionospheric Multi-Instrument Imaging”. In: *Journal of Geophysical Research: Space Physics* 128.1 (2023). e2022JA030794 2022JA030794, e2022JA030794. DOI: <https://doi.org/10.1029/2022JA030794>. eprint: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2022JA030794>. URL: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2022JA030794>.
- [38] Jarkko Suuronen, Tomás Soto, Neil K Chada, and Lassi Roininen. “Bayesian inversion with α -stable priors”. In: *Inverse Problems* 39.10 (Aug. 2023), p. 105007. DOI: [10.1088/1361-6420/acf154](https://doi.org/10.1088/1361-6420/acf154). URL: <https://dx.doi.org/10.1088/1361-6420/acf154>.
- [39] Angelina Senchukova, Jarkko Suuronen, Jere Heikkinen, and Lassi Roininen. “Geometry Parameter Estimation for Sparse X-Ray Log Imaging”. In: *Journal of Mathematical Imaging and Vision* (2023). DOI: <https://doi.org/10.1007/s10851-023-01167-6>.
- [40] Sebastian Springer, Aldo Glielmo, Angelina Senchukova, Tomi Kauppi, Jarkko Suuronen, Lassi Roininen, Heikki Haario, and Andreas Hauptmann. “Reconstruction and segmentation from sparse sequential X-ray measurements of wood logs”. In: *Applied Mathematics for Modern Challenges* 1.1 (2023), pp. 1–20. DOI: [10.3934/ammc.2023002](https://doi.org/10.3934/ammc.2023002). URL: <https://www.aims.scientific.org/article/id/64e87573774d4574c8bfa66b>.
- [41] Teemu Härkönen, Erik M. Vartiainen, Lasse Lensu, Matthew T. Moores, and Lassi Roininen. “Log-Gaussian Gamma Processes for Training Bayesian Neural Networks in Raman and CARS Spectroscopies”. In: *Physical Chemistry Chemical Physics* 26 (2024), pp. 3389–3399.

- [42] Angelina Senchukova, Felipe Uribe, and Lassi Roininen. “Bayesian inversion with Student’s t priors based on Gaussian scale mixtures”. In: *Inverse Problems, to appear* (2024).

Working papers

- [43] Teemu Härkönen, Sara Wade, Kody Law, and Lassi Roininen. *Mixtures of Gaussian Process Experts with SMC²*. 2022. eprint: [arXiv:2208.12830](https://arxiv.org/abs/2208.12830).
- [44] Neil K. Chada, Petteri Piiroinen, and Lassi Roininen. *A Statistical Framework and Analysis for Perfect Radar Pulse Compression*. 2023. eprint: [arXiv:2308.07597](https://arxiv.org/abs/2308.07597).
- [45] Michel Rwema, Mouhamadou Bamba Sylla, Bonfils Safari, Lassi Roininen, and Marko Laine. *Trends analysis and change point detection in precipitation time series over the Eastern Province of Rwanda during 1981–2021*. 2024. eprint: <https://doi.org/10.21203/rs.3.rs-3911118/v1>.
- [46] Rabia Altunay, Kalevi Vesterinen, Pasi Alander, Eero Immonen, Andreas Rupp, and Lassi Roininen. *Denture reinforcement via topology optimization*. 2023. eprint: [arXiv:2309.00396](https://arxiv.org/abs/2309.00396).
- [47] Yassin Tesfaw, Abdu Mohammed Seid, and Lassi Roininen. *Log-Gaussian Cox Processes for Spatiotemporal Traffic Fatality Estimation in Addis Ababa*. 2024. eprint: [arXiv:2408.02612](https://arxiv.org/abs/2408.02612).

Conference proceedings

- [48] Sari Lasanen and Lassi Roininen. “Statistical Inversion with Green’s Priors”. In: *Proc. 5th Int. Conf. on Inv. Prob. in Eng.* 2005, L01:1–10.
- [49] Lassi Roininen, Markku Lehtinen, and Petteri Piiroinen. “Calculating Covariance Kernels of Stochastic Differential and Difference Equations with Applications in Bayesian Statistical Inversion”. In: vol. 1281. 1. 2010, pp. 1816–1819. DOI: <http://dx.doi.org/10.1063/1.3498244>. URL: <http://scitation.aip.org/content/aip/proceeding/aipcp/10.1063/1.3498244>.
- [50] Antti Kero, Carl-Fredrik Enell, Lassi Roininen, Thomas Ulich, Esa Turunen, Ingemar Häggström, Pekka T. Verronen, and Sanna M. Salmi. “The D-region ionosphere during the solar minimum as seen by the EISCAT Svalbard continuous 1-year IPY radar experiment”. In: *General Assembly and Scientific Symposium, 2011 XXXth URSI*. Aug. 2011, pp. 1–4. DOI: [10.1109/URSIGASS.2011.6050889](https://doi.org/10.1109/URSIGASS.2011.6050889).
- [51] Johannes Norberg, Juha Vierinen, Lassi Roininen, Olaf Amm, and Markku S. Lehtinen. “Multi-instrument ionospheric tomography in Scandinavia with Bayesian statistical inversion and correlation priors”. In: *Radio Science Meeting (USNC-URSI NRSM), 2014 United States National Committee of URSI National*. Jan. 2014, pp. 1–1. DOI: [10.1109/USNC-URSI-NRSM.2014.6928076](https://doi.org/10.1109/USNC-URSI-NRSM.2014.6928076).
- [52] E. Immonen, M. Lauren, L. Roininen, and S. Särkkä. “Neural Network Based Identification of Fuel Injection Rate Profiles for Diesel Engines”. In: *2020 9th International Conference on Industrial Technology and Management (ICITM)*. 2020, pp. 138–143. DOI: [10.1109/ICITM48982.2020.9080367](https://doi.org/10.1109/ICITM48982.2020.9080367).
- [53] Eero Immonen, Mika Lauren, Lassi Roininen, and Simo Särkkä. “Multiobjective model-based optimization of diesel injection rate profile by machine learning methods”. In: *Proceedings of 2020 IEEE International Systems Conference*. 2020.
- [54] Arttu Arjas, Lassi Roininen, Mikko Sillanpää, and Andreas Hauptmann. “Blind Hierarchical Deconvolution”. In: *2020 IEEE 30th International Workshop on Machine Learning for Signal Processing (MLSP)*. 2020, pp. 1–6. DOI: [10.1109/MLSP49062.2020.9231822](https://doi.org/10.1109/MLSP49062.2020.9231822).
- [55] Rabia Altunay, Eero Immonen, Jarkko Suuronen, Andreas Rupp, and Lassi Roininen. “Reinforcement Approach Using Topology Optimization”. In: *Proceedings of the 38th ECMS International Conference on Modelling and Simulation*. 2024.

D Theses

- [57] Lassi Roininen. “Using Discretization Independent Priors in Bayesian Regularization”. MA thesis. Tampere University of Technology, 2003. URL: http://www.math.tut.fi/julkaisut/pdf/di_lassi_roininen.pdf.
- [58] Lassi Roininen. “Discretisation-invariant and computationally efficient correlation priors for Bayesian inversion”. PhD thesis. University of Oulu, 2015. ISBN: 978-952-62-0754-4. URL: <http://urn.fi/urn:isbn:9789526207544>.