

List of Publications

Mrs. Larisa Beilina, Ph.D. in Mathematics

p.nr. 19700210-1728

Docent, Associate Professor

Department of Mathematical Sciences

Chalmers University of Technology and Gothenburg University, Sweden

Peer-reviewed articles

1. L. Beilina, Adaptive hybrid FEM/FDM methods for inverse scattering problems. *Inverse Problems and Information Technologies*, V.1, N.3, pp.73-116, 2002.
2. L. Beilina, Adaptive hybrid finite element/difference methods: application to inverse elastic scattering. *Inverse and Ill-Posed Problems*, V.11, N.6, pp.585-618, 2003.
3. L. Beilina, Efficiency of a Hybrid FEM/FDM methods for elastic waves, *Applied and Computational Mathematics*, V.2, N.1, pp.13-29, 2003.
4. L. Beilina, Adaptive Finite Element/Difference Method for inverse elastic scattering waves , *Applied and Computational Mathematics*, V.2, pp.119-134, 2003.
5. L. Beilina, S. Korotov, M. Krizek, Local Nonobtuse tetrahedral refinement techniques near Fichera-like corners. *Applications of Mathematics*, N.50, pp. 569-581, 2005.
6. L. Beilina, C. Johnson, A posteriori error estimation in computational inverse scattering, *Mathematical Models and Methods in Applied Sciences*, V.15, N.1, pp.23-37, 2005.
7. L. Beilina and C. Clason, An adaptive hybrid FEM/FDM method for an inverse scattering problem in scanning acoustic microscopy, *SIAM Sci.Comp.*, V.28, I.1, pp.382-402, 2006.
8. L. Beilina, M. V. Klibanov, A globally convergent numerical method for some coefficient inverse problems with resulting second order elliptic equations, *SIAM Sci.Comp.*, V.31, N.1, 478-509, 2008.
9. L. Beilina, M. P. Hatlo, H. E. Krogstad, Adaptive algorithm for an inverse electromagnetic scattering problem, *Applicable Analysis*, V.88, N.1, 15-28, 2009.
10. L. Beilina and M. V. Klibanov. A posteriori error estimates for the adaptivity technique for the Tikhonov functional and global convergence for a coefficient inverse problem, *J. Inverse Problems*, 26, 045012, 2010.

11. L. Beilina and M. V. Klibanov. Synthesis of global convergence and adaptivity for a hyperbolic coefficient inverse problem in 3D, *J. Inverse and Ill-posed problems*, 18(1), 85-132, 2010.
12. M.V. Klibanov, M.A. Fiddy, L. Beilina, N. Pantong and J. Schenk, Picosecond scale experimental verification of a globally convergent numerical method for a coefficient inverse problem, *J. Inverse problems*, 26, 045003, 2010.
13. J. Xin, L.Beilina, Michael V.Klibanov, Globally convergent numerical methods for coefficient inverse problems for imaging inhomogeneities, accepted for publication in *CISE*, 2010.
14. L.Beilina, M.V.Klibanov and M.Yu.Kokurin, Adaptivity with relaxation for ill-posed problems and global convergence for a coefficient inverse problem, *Journal of Mathematical Sciences, JMS*, Springer, 167(3), 279-325, 2010.
15. L.Beilina, Adaptive Finite Element Method for a coefficient inverse problem for the Maxwell's system, *Applicable Analysis*, V.90(10), pp.1461-1479, 2011.
16. L.Beilina, Adaptive Hybrid Finite Element/Difference Method for Maxwell's Equations: An a Priori Error Estimate and Efficiency, *Applied and Computational Mathematics (ACM)*, V.9(2), 2010.
17. M. Asadzadeh and L. Beilina, A posteriori error analysis in a globally convergent numerical method for a hyperbolic coefficient inverse problem, *Inverse Problems*, 26, 115007, 2010.
18. L. Beilina, M. Grote, Adaptive Hybrid Finite Element/Difference Method for Maxwell's equations, *TWMS J. of Pure and Applied Mathematics*, V.1(2), pp.176-197, 2010.
19. A.Kuzhuget, L.Beilina, M.V.Klibanov, Global convergence and quasi-reversibility for a coefficient inverse problem with backscattered data, *Journal of Mathematical Sciences, JMS*, Springer, 2012.
20. L.Beilina, M.V.Klibanov, A.Kuzhuget, New a posteriori error estimates for adaptivity technique and global convergence for a hyperbolic coefficient inverse problem, *Journal of Mathematical Sciences, JMS*, Springer, 172, 4, 449-476, 2011.
21. L.Beilina, M.V.Klibanov, Reconstruction of dielectrics from experimental data via a hybrid globally convergent/adaptive inverse algorithm, *Inverse Problems*, 26, 125009, 2010.
22. M.V.Klibanov, A.B.Bakushinsky, L.Beilina, Why a minimizer of the Tikhonov functional is closer to the exact solution than the first guess, *J. Inverse and Ill-posed problems*, 19, pp.83-105, 2011.

23. L. Beilina, M. V. Klibanov, The philosophy of the approximate global convergence for multidimensional coefficient inverse problems *Complex Variables and Elliptic Equations*, V. 57, Issue 2-4, pp.277-299, 2012.
24. L. Beilina, Energy estimates and numerical verification of the stabilized domain decomposition finite element/finite difference approach for the Maxwell's system in time domain, *CEJM*, 11(4), pp.702-733, DOI: 10.2478/s11533-013-0202-3, 2013.
25. L. Beilina and M.V. Klibanov, A new approximate mathematical model for global convergence for a coefficient inverse problem with backscattering data, *J. Inverse and Ill-Posed Problems*, 20, pp.513-565, 2012.
26. A.V. Kuzhuget, L. Beilina, M.V. Klibanov, A. Sullivan, L. Nguyen and M.A. Fiddy, Blind backscattering experimental data collected in the field and an approximately globally convergent inverse algorithm, *Inverse Problems*, 28, 095007, 2012.
27. A.V. Kuzhuget, L. Beilina, M.V. Klibanov, A. Sullivan, L. Nguyen and M.A. Fiddy, Quantitative image recovery from measured blind backscattered data using a globally convergent inverse method, *IEEE Transactions of Geoscience and Remote Sensing*, DOI 10.1109/TGRS.2012.2211885, 2012.
28. A.V. Kuzhuget, L. Beilina and M.V. Klibanov, Approximate global convergence and quasi-reversibility for a coefficient inverse problem with backscattering data, *J. of Mathematical Sciences*, 181, pp.126-163, 2012.
29. L. Beilina, M. V. Klibanov, Relaxation property for the adaptivity for ill-posed problems, *Applicable Analysis*, DOI:10.1080/00036811.2013.768339, 2013.
30. N. Koshev and L. Beilina, An Adaptive Finite Element Method for Fredholm Integral Equations of the first kind and its verification on experimental data, *CEJM*, 11(8), pp. 1489-1509 2013.
31. L. Beilina, Nguyen Trung Thành, M. V. Klibanov and M. A. Fiddy, Reconstruction from blind experimental data for an inverse problem for a hyperbolic equation, *Inverse Problems* 30, 025002, doi:10.1088/0266-5611/30/2/025002, 2014.
32. Nguyen Trung Thành, L. Beilina, M. V. Klibanov and M. A. Fiddy, Reconstruction of the refractive index from experimental backscattering data using a globally convergent inverse method, *SIAM J. Scientific Computing*, 36 (3), pp.273-293, 2014.
33. E. M. Karchevskii, A. O. Spiridonov, A. I. Repina and L. Beilina, "Reconstruction of Dielectric Constants of Core and Cladding of Optical Fibers Using Propagation Constants Measurements," *Physics Research International*, ID 253435, 2014. doi:10.1155/2014/253435.

34. L. Beilina, Nguyen Trung Thành, M. V. Klibanov and J. B. Malmberg, Reconstruction of shapes and refractive indices from backscattering experimental data using the adaptivity, *Inverse Problems*, 30, 105007, 2014.
35. L. Beilina, M. V. Klibanov, Globally strongly convex cost functional for a coefficient inverse problem, *Nonlinear analysis: real world applications*, 22, 272-288, 2015.
36. L. Beilina, Nguyen Trung Thanh, M.V. Klibanov and J. B. Malmberg, Globally convergent and adaptive finite element methods in imaging of buried objects from experimental backscattering radar measurements, *Journal of Computational and Applied Mathematics*, Elsevier, DOI: 10.1016/j.cam.2014.11.055, 2015.
37. N. T. Thanh, L. Beilina, M. V. Klibanov, M. A. Fiddy, Imaging of Buried Objects from Experimental Backscattering Time-Dependent Measurements Using a Globally Convergent Inverse Algorithm, *SIAM Journal on Imaging Sciences*, 8(1), 757-786, 2015.
38. L. Beilina, M. Cristofol and K. Niinimäki, Optimization approach for the simultaneous reconstruction of the dielectric permittivity and magnetic permeability functions from limited observations, *Inverse Problems and Imaging*, 9 (1), pp. 1-25, 2015.

Peer-reviewed conference proceedings

1. L. Beilina, A posteriori error estimation in biomedical imaging, IEEE ISBI2007, *Proceedings of International Symposium on Biomedical Imaging: from nano to macro*, pp.1372-1375, 2007.
2. L. Beilina, A posteriori error estimation for an inverse scattering problem, *Proceedings of ECCOMAS thematic conference Computational Methods in Structural Dynamic and Earthquake Engineering*, 2007.
3. L.Beilina, M.V.Klibanov, Global convergence for Inverse Problems, *Proceedings of ICNAAM2010, AIP (American Institute of Physics) Conference Proceedings*, 2010.
4. L.Beilina, Adaptive Finite Element Method for an electromagnetic coefficient inverse problem, *Proceedings of ICNAAM2010, AIP (American Institute of Physics) Conference Proceedings*, 2010.
5. L.Beilina, Hybrid Discontinuous Finite Element/Finite Difference Method for Maxwell's equations, *Proceedings of ICNAAM2010, AIP (American Institute of Physics) Conference Proceedings*, 2010.
6. L. Beilina and M. V. Klibanov, Approximate global convergence in imaging of land mines from backscattered data, *Applied Inverse Problems, Springer Proceedings in Mathematics Statistics* , Vol. 48, 2013.

7. L. Beilina and I. Gainova, Time-adaptive FEM for distributed parameter identification in biological models, *Applied Inverse Problems, Springer Proceedings in Mathematics Statistics* , Vol. 48, 2013.
8. L. Beilina, M. P. Hatlo Andresen, H. E. Krogstad, Adaptive finite element method in reconstruction of dielectrics from backscattered data, *Applied Inverse Problems, Springer Proceedings in Mathematics Statistics* , Vol. 48, 2013.
9. N. Koshev and L. Beilina, A posteriori error estimates for Fredholm integral equations of the first kind, *Applied Inverse Problems, Springer Proceedings in Mathematics Statistics* , Vol. 48, 2013.
10. L. Beilina and M. V. Klibanov, Adaptive FEM with relaxation for a hyperbolic coefficient inverse problem, *Applied Inverse Problems, Springer Proceedings in Mathematics Statistics* , Vol. 48, 2013.
11. M. Asadzadeh and L. Beilina, Adaptive approximate globally convergent algorithm with backscattered data, *Inverse Problems and Large-Scale Computations, Springer Proceedings in Mathematics Statistics* , Vol. 52, 2013.
12. J. Bondestam Malmberg and L. Beilina, Approximate globally convergent algorithm with applications in electrical prospecting, *Inverse Problems and Large-Scale Computations, Springer Proceedings in Mathematics Statistics* , Vol. 52, 2013.
13. L. Beilina, N.T. Thành, M.V. Klibanov, and J.B. Malmberg, Methods of quantitative reconstruction of shapes and refractive indices from experimental data, *Inverse Problems and Applications, Springer Proceedings in Mathematics Statistics* , Vol. 120, 2015.
14. Evgenii Karchevskii, Alexandr Spiridonov, and Larisa Beilina, Determination of permittivity from propagation constant measurements in optical fibers, *Inverse Problems and Applications, Springer Proceedings in Mathematics Statistics* , Vol. 120, 2015.
15. Larisa Beilina and Anders Eriksson, Reconstruction of dielectric constants in a cylindrical waveguide, *Inverse Problems and Applications, Springer Proceedings in Mathematics Statistics* , Vol. 120, 2015.
16. Larisa Beilina and Irina Gainova, Time-adaptive FEM for distributed parameter identification in mathematical model of HIV infection with drug therapy, *Inverse Problems and Applications, Springer Proceedings in Mathematics Statistics* , Vol. 120, 2015.
17. Larisa Beilina and Evgenii Karchevskii, The layer-stripping algorithm for reconstruction of dielectrics in an optical fiber, *Inverse Problems and Applications, Springer Proceedings in Mathematics Statistics* , Vol. 120, 2015.

18. L. Beilina, M. Cristofol and K. Niinimäki, Simultaneous reconstruction of Maxwell's coefficients from backscattering data, *Inverse Problems and Applications, Springer Proceedings in Mathematics Statistics* , Vol. 120, 2015.

Books

- **L. Beilina**, M.V. Klibanov, *Approximate global convergence and adaptivity for coefficient inverse problems*, Springer, New-York, 2012 (Number of citations: *Google scholar* 81.)
- **L. Beilina** (Ed.), *Applied Inverse Problems*, Series: Springer Proceedings in Mathematics Statistics, Vol. 48, DOI 10.1007/978-1-4614-7816-4, 2013.
- **L. Beilina**, Shestopalov, Yury V. (Eds.), *Inverse Problems and Large-Scale Computations*, Series: Springer Proceedings in Mathematics Statistics, Vol. 52, DOI: 10.1007/978-3-319-00660-4, 2013.
- **L. Beilina**, (Ed.), *Inverse Problems and Applications*, Series: Springer Proceedings in Mathematics & Statistics, Vol.120, ISBN 978-3-319-12498-8, 2015.

Open-access computer programs

Software package **WavES** for the numerical solution of different types of time-dependent wave equations (acoustic, elastic and electromagnetic).

Project cite: <http://waves24.com/>

Popular science articles/presentations

L. Beilina, Solving the unsolvable, *International Innovation*, March 2013, (Research Media, UK, pp.112-114) ISSN 2041-4552.