

## Schriftenverzeichnis/List of Publications

### Qualifizierungsarbeiten/Theses

- [1] L. Angermann. Die Regularisierung einer Klasse singulärer Integralgleichungen. Diplomarbeit (in Russisch), Universität Charkow, 1982.
- [2] L. Angermann. Die Grundgleichungen der inneren Elektronik als Evolutionsproblem im Banach-Raum – Modellanalyse und Semidiskretisierung. Dissertation, TU Dresden, 1987.
- [3] L. Angermann. A posteriori Fehlerabschätzungen für Lösungen gestörter Operatorgleichungen. Habilitationsschrift, Universität Erlangen-Nürnberg, 1994.

### Preprints (nicht anderweitig publiziert/not published elsewhere)

- [1] A. Anees and L. Angermann. An energy stable discontinuous Galerkin time-domain finite element method in optics and photonics. e-print [arxiv.org/abs/2306.12975](https://arxiv.org/abs/2306.12975), 2023.
- [2] L. Angermann. Lokale Existenz, Eindeutigkeit und Vorzeicheninvarianz der Lösung einer quasilinearen Anfangs-Randwertaufgabe. Informationen der TU Dresden 07-19-84, TU Dresden, 1984.
- [3] L. Angermann. The application of mass-lumping techniques to the basic equations of inner electronics. Informationen der TU Dresden 07-04-87, TU Dresden, 1987.
- [4] L. Angermann.  $L_\infty$ -stability of some mass-lumping semidiscretizations of the transient semiconductor device equations. Informationen der TU Dresden 07-12-88, TU Dresden, 1988.
- [5] L. Angermann. A refinement indicator for the mesh-control in solving plane elliptic problems. Informationen der TU Dresden 07-19-89, TU Dresden, 1989.
- [6] L. Angermann. Zur Simulation der Migration von Radionukliden im Untergrund. Bericht SAAS-366, Staatliches Amt für Atomsicherheit und Strahlenschutz der DDR, 1989.
- [7] L. Angermann. Computable interior error indicators for the numerical solution of Helmholtz' equation. Informationen der TU Dresden 07-08-90, TU Dresden, 1990.
- [8] L. Angermann. Computable estimation of error indicators associated with local boundary value problems. Informationen der TU Dresden 07-04-91, TU Dresden, 1991.
- [9] L. Angermann. Pseudouniform in  $\varepsilon$  convergence of the finite element solution of an elliptic singularly perturbed problem. Bericht 148, Institut für Angewandte Mathematik, Universität Erlangen-Nürnberg, 1991.
- [10] L. Angermann. On  $\varepsilon$ -uniform  $L_\infty$ -stability of a FVM-discretization of a singularly perturbed elliptic problem. Bericht 155, Institut für Angewandte Mathematik, Universität Erlangen-Nürnberg, 1992.

- [11] L. Angermann. An introduction to finite volume methods for linear elliptic equations of second order. Bericht 164, Institut für Angewandte Mathematik, Universität Erlangen-Nürnberg, 1995.
- [12] L. Angermann. An upwind scheme of finite volume type with reduced crosswind diffusion. Bericht 165, Institut für Angewandte Mathematik, Universität Erlangen-Nürnberg, 1995.
- [13] L. Angermann. A finite element method for the numerical solution of convection-dominated anisotropic diffusion equations. Bericht 201, Institut für Angewandte Mathematik, Universität Erlangen-Nürnberg, 1996.
- [14] L. Angermann. Finite volume schemes as non-conforming Petrov-Galerkin approximations of primal-dual mixed formulations. Bericht 181, Institut für Angewandte Mathematik, Universität Erlangen-Nürnberg, 1996.
- [15] L. Angermann. Error analysis of upwind-discretizations for the steady-state incompressible Navier-Stokes equations. Preprint Nr. 33, Fakultät für Mathematik, Otto-von-Guericke-Universität Magdeburg, 1998. (Part 1 was published in *Advances in Computational Mathematics*, 13:167–198, 2000, Part 2 (Applications) is still unpublished).
- [16] L. Angermann. Residual type *a posteriori* error estimates for upwinding finite volume approximations of elliptic boundary value problems. Mathematik-Bericht 2010/1, Institut für Mathematik, Technische Universität Clausthal, 2010.
- [17] L. Angermann. *A posteriori* estimates for errors of functionals on finite volume approximations to solutions of elliptic boundary value problems. e-print [arxiv.org/abs/1205.1980](https://arxiv.org/abs/1205.1980), 2012.
- [18] L. Angermann. Semi-discrete finite element approximation applied to Maxwell's equations in nonlinear media. e-print [arxiv.org/abs/1901.03605](https://arxiv.org/abs/1901.03605), 2019.
- [19] L. Angermann. Finite element solution of a radiation/propagation problem for a Helmholtz equation with a compactly supported nonlinearity. e-print [arxiv.org/abs/2307.09103](https://arxiv.org/abs/2307.09103), 2023.
- [20] L. Angermann, W. Burmeister, S. Kretzschmar, and H.-G. Roos. Prinzipien der Gittergenerierung und Gittersteuerung bei der Lösung elliptischer Randwertaufgaben. Informationen der TU Dresden 07-22-89, TU Dresden, 1989.
- [21] L. Angermann, P. Knabner, and A. Rupp. Error estimates for completely discrete FEM in energy-type and weaker norms. e-print [arxiv.org/abs/2301.06860](https://arxiv.org/abs/2301.06860), 2023.
- [22] L. Angermann, Y.V. Shestopalov, Y.G. Smirnov, and V.V. Yatsyk. Nonlinear multi-parameter eigenvalue problems for systems of nonlinear ordinary differential equations arising in electromagnetics. Oberwolfach Preprint OWP 2014-15, Mathematisches Forschungsinstitut, Oberwolfach, 2014.

- [23] L. Angermann and S. Wang. An exponentially fitted conforming tetrahedral finite element method for the semiconductor continuity equations. Preprint Nr. 10, Fakultät für Mathematik, Otto-von-Guericke-Universität Magdeburg, 1999.
- [24] S. Gadau and L. Angermann. Der Finite-Volumen-Modul des Programmpaketes MooNMD. Technical Report Nr. 2, Fakultät für Mathematik, Otto-von-Guericke-Universität Magdeburg, 2001.
- [25] J. Rang and L. Angermann. Remarks on the differentiation index and on the perturbation index of non-linear differential algebraic equations. Mathematik-Bericht 2005/3, Institut für Mathematik, Technische Universität Clausthal, 2005.

### Zeitschriftenartikel/Journal Papers

- [1] A. Anees and L. Angermann. Time domain finite element method for Maxwell's equations. *IEEE Access*, 7:63852–63867, 2019.
- [2] A. Anees and L. Angermann. Energy-stable time-domain finite element methods for the 3D nonlinear Maxwell's equations. *IEEE Photonics Journal*, 12(2):1–15, 2020.
- [3] A. Anees and L. Angermann. Energy stable time domain finite element methods for nonlinear models in Optics and Photonics. *Internat. J. Numer. Anal. Mod.*, 19(4):511–541, 2022.
- [4] L. Angermann. Zur Invarianz von  $W_p^1$ -Räumen gegenüber Lipschitz-stetigen Abbildungen. *Wiss. Zeitschrift der TU Dresden*, 34(4):72, 1985.
- [5] L. Angermann. Die Grundgleichungen der inneren Elektronik – ein Evolutionsproblem im Banach-Raum. *Zeitschrift für Analysis und ihre Anwendungen*, 6(4):321–330, 1987.
- [6] L. Angermann. A mass-lumping semidiscretization of the semiconductor device equations, Parts I and II. *COMPEL*, 8(2):65–105, 1989.
- [7] L. Angermann. Numerical solution of second-order elliptic equations on plane domains. *RAIRO Modél. Math. Anal. Numér.*, 25(2):169–191, 1991.
- [8] L. Angermann. An a-posteriori estimation for the solution of elliptic boundary value problems by means of upwind FEM. *IMA J. Numer. Anal.*, 12:201–215, 1992.
- [9] L. Angermann. Addendum to the paper “Numerical solution of second-order equations on plane domains”. *RAIRO Modél. Math. Anal. Numér.*, 27(1):1–7, 1993.
- [10] L. Angermann. Balanced a-posteriori error estimates for finite volume type discretizations of convection-dominated elliptic problems. *Computing*, 55(4):305–323, 1995.
- [11] L. Angermann. Error estimates for the finite-element solution of an elliptic singularly perturbed problem. *IMA J. Numer. Anal.*, 15:161–196, 1995.

- [12] L. Angermann. A posteriori error estimates for approximate solutions of nonlinear equations with weakly stable operators. *Numer. Funct. Anal. Optim.*, 18(5&6):447–459, 1997.
- [13] L. Angermann. Error analysis of upwind-discretizations for the steady-state incompressible Navier-Stokes equations. *Advances in Computational Mathematics*, 13:167–198, 2000.
- [14] L. Angermann. A finite element method for the numerical solution of convection-dominated anisotropic diffusion equations. *Numer. Math.*, 85(2):175–195, 2000.
- [15] L. Angermann. A posteriori error estimates for FEM with violated Galerkin orthogonality. *Numer. Meth. PDE*, 18(2):241–259, 2002.
- [16] L. Angermann. Node-centered finite volume schemes and primal-dual mixed formulations. *Communications in Applied Analysis*, 7(4):529–566, 2003.
- [17] L. Angermann. Transport-stabilized semidiscretizations of the incompressible Navier-Stokes equations. *Comput. Methods Appl. Math.*, 6(3):239–263, 2006.
- [18] L. Angermann. Discretization of the Black-Scholes operator with a natural left-hand side boundary condition. *Far East J. Appl. Math.*, 30(1):1–41, 2008.
- [19] L. Angermann. A radiation and propagation problem for a Helmholtz equation with a compactly supported nonlinearity. *Commun. Nonlinear Sci. Numer. Simul.*, 126:107422, 2023.
- [20] L. Angermann and C. Henke. Interpolation, projection and hierarchical bases in discontinuous Galerkin methods. *Numerical Mathematics: Theory, Methods and Applications*, 8(3):425–450, 2015.
- [21] L. Angermann, P. Knabner, and K. Thiele. An error estimator for a finite volume discretization of density driven flow in porous media. *Appl. Numer. Math.*, 26(1-2):179–191, 1998.
- [22] L. Angermann, V.F. Kravchenko, V.I. Pustovoit, and V.V. Yatsyk. Resonance scattering and generation of oscillations by channeling nonlinear layered media. *Doklady Akademii Nauk*, 453(5):496–500, 2013. In Russian. English translation: *Doklady Physics*, 58(12):535–539, 2013.
- [23] L. Angermann and J. Rang. Perturbation index of linear partial differential-algebraic equations with a hyperbolic part. *Central European Journal of Mathematics*, 5(1):19–49, 2007.
- [24] L. Angermann and J. Rang. The perturbation index of PDAE models in groundwater flow simulations. *Far East J. Appl. Math.*, 36(3):271 – 295, 2009.
- [25] L. Angermann, Y.V. Shestopalov, and V.V. Yatsyk. Mathematical models for scattering and generation of plane wave packets on layered, cubically polarisable structures. *Far East J. Appl. Math.*, 81(1-2):1–31, 2013.

- [26] L. Angermann and S. Wang. Three-dimensional exponentially fitted conforming tetrahedral finite elements for the semiconductor continuity equations. *Appl. Numer. Math.*, 46(1):19–43, 2003.
- [27] L. Angermann and S. Wang. Multidimensional exponentially fitted simplicial finite elements for convection-diffusion equations with tensor-valued diffusion. *Calcolo*, 42(2):71–91, 2005.
- [28] L. Angermann and S. Wang. Convergence of a fitted finite volume method for the penalized Black-Scholes equation governing European and American option pricing. *Numer. Math.*, 106(1):1–40, 2007.
- [29] L. Angermann and S. Wang. A super-convergent unsymmetric finite volume method for convection-diffusion equations. *J. Comput. Appl. Math.*, 358(1):179–189, 2019.
- [30] L. Angermann and V.V. Yatsyk. Numerical simulation of the diffraction of weak electromagnetic waves by a Kerr-type nonlinear dielectric layer. *Int. J. Electromagnetic Waves and Electronic Systems*, 13(12):15–30, 2008.
- [31] L. Angermann and V.V. Yatsyk. Mathematical models of the analysis of processes of resonance scattering and generation of the third harmonic by the diffraction of a plane wave through a layered, cubically polarisable structure. *Int. J. Electromagnetic Waves and Electronic Systems*, 15(1):36–49, 2010. In Russian.
- [32] L. Angermann and V.V. Yatsyk. The influence of weak fields at multiple frequencies on the process of resonant scattering and generation of oscillations by nonlinear layered structures. *Physical Bases of Instrumentation*, 2(1):48–71, 2013. In Russian.
- [33] L. Angermann and V.V. Yatsyk. Mathematical models of electrodynamic processes of wave scattering and generation on cubically polarisable layers. *Progress In Electromagnetics Research B*, 56:109–136, 2013.
- [34] L. Angermann and V.V. Yatsyk. The multifunctional process of resonance scattering and generation of oscillations by nonlinear layered structures. *Cogent Physics*, 3:1158342, 2016.
- [35] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The type-conversion of oscillations at the excitation of nonlinear layered media. *Bulletin of V. Karazin Kharkiv National University, Series Mathematical Modelling, Information Technology, Automated Control Systems*, 27:13–21, 2015.
- [36] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. About one approach to the analysis of resonant scattering and wave generation by nonlinear layered and periodic structures. *Physical Bases of Instrumentation*, 6(1):106–117, 2017. In Russian.
- [37] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The dynamics of processes of resonant scattering and generation of waves by a three-layer dielectric with a nonlinear medium. *Bulletin of V. Karazin Kharkiv National University, Series Mathematical Modelling, Information Technology, Automated Control Systems*, 33:7–18, 2017.

- [38] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Methods for analyzing the scattering and generation processes of waves by nonlinear layered media. *Physical Bases of Instrumentation*, 6(4):46–55, 2017. In Russian.
- [39] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The conversion of excitation energy into generated energy at the resonant frequencies of a transparent nonlinear layer. *Advanced Electromagnetics*, 8(1):66–74, 2019.
- [40] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Energy characteristics of a nonlinear layer at resonant frequencies of wave scattering and generation. *Open Physics*, 17(2):222–232, 2019.
- [41] C. Henke and L. Angermann.  $L^\infty(L^\infty)$ -boundedness of DG( $p$ )-solutions for nonlinear conservation laws with boundary conditions. *IMA J. Numer. Anal.*, 34(4):1598–1624, 2014. Erratum: *IMA J. Numer. Anal.*, 35(3):1483–1485, 2015.
- [42] C. Henke and L. Angermann. Erratum to the paper “ $L^\infty(L^\infty)$ -boundedness of DG( $p$ )-solutions for nonlinear conservation laws with boundary conditions”. *IMA J. Numer. Anal.*, 35(3):1483–1485, 2015.
- [43] J. Rang and L. Angermann. New Rosenbrock W-methods of order 3 for PDAEs of index 1. *BIT*, 45(4):761–787, 2005.
- [44] J. Rang and L. Angermann. Perturbation index of linear partial differential algebraic equations. *Appl. Numer. Math.*, 53(2-4):437–456, 2005.
- [45] J. Rang and L. Angermann. New Rosenbrock methods of order 3 for PDAEs of index 2. *Advances in Differential Equations and Control Processes*, 1(2):193–217, 2008.
- [46] S. Wang and L. Angermann. On convergence of the exponentially fitted volume method with an anisotropic mesh refinement for a singularly perturbed convection-diffusion equation. *Comput. Methods Appl. Math.*, 3(3):493–512, 2003.

### Buchbeiträge/Book Chapters

- [1] L. Angermann and H.-G. Roos. A posteriori error estimates for elliptic boundary value problems. Chapter 8 of *Computational methods for boundary and interior layers in several dimensions*, J.J.H. Miller (ed.), pages 154–174. Boole Press, Dublin, 1991.
- [2] L. Angermann and V.V. Yatsyk. Generation and resonance scattering of waves on cubically polarisable layered structures. In L. Angermann, editor, *Numerical Simulations – Applications, Examples and Theory*, pages 175–212. InTech, Rijeka/Vienna, Croatia/Austria, 2011.
- [3] L. Angermann and V.V. Yatsyk. Resonance properties of scattering and generation of waves on cubically polarisable dielectric layers. In V. Zhurbenko, editor, *Electromagnetic Waves*, pages 299–340. InTech, Rijeka/Vienna, Croatia/Austria, 2011.

- [4] L. Angermann and V.V. Yatsyk. The effect of weak fields at multiple frequencies on the scattering and generation of waves by nonlinear layered media. In A. Kishk, editor, *Solutions and Applications of Scattering, Propagation, Radiation and Emission of Electromagnetic Waves*, pages 303–332 (307–336 electronic). InTech, Rijeka, Croatia, 2012.

### Konferenzbeiträge/Conference Proceedings

- [1] A. Al Nabulsi, O. Abdalla, L. Angermann, and A. Bolz. New modification of Lamberts-Beer’s law using simulation of light propagation in tissue for accurate non-invasive Hemoglobin measurements. In *International Conference on Applied Mathematics and Pharmaceutical Sciences (ICAMPS 2012), 7–8 January 2012, Dubai*, pages 601–608, Pattaya, Thailand, 2012. Planetary Scientific Research Center (PSRC).
- [2] A. Al Nabulsi, L. Angermann, O. Abdalla, and A. Bolz. Mathematical modeling and simulation of light propagation in multi-layers earlobe for non-invasive Hemoglobin measurements. In C. Hellmich, M.H. Hamza, and D. Simsik, editors, *Proceedings of The Ninth IASTED International Conference on Biomedical Engineering (BioMed 2012), 15–17 February 2012, Innsbruck, Austria*, Calgary, 2012. ACTA Press.
- [3] A. Anees and L. Angermann. A mixed finite element method approximation for the Maxwell’s equations in Electromagnetics. In *2016 IEEE International Conference on Wireless Information Technology and Systems (ICWITS) and Applied Computational Electromagnetics (ACES), Honolulu, Hawaii, March 13-17*, pages 179–180, 2016.
- [4] A. Anees and L. Angermann. Mixed finite element methods for the Maxwell’s equations with matrix parameters. In *2018 International Applied Computational Electromagnetics Society (ACES) Symposium*, 2018. Denver, Colorado, March 24–29, 2018.
- [5] A. Anees and L. Angermann. Time-domain finite element methods for Maxwell’s equations in three dimensions. In *2018 International Applied Computational Electromagnetics Society (ACES) Symposium*, 2018. Denver, Colorado, March 24–29, 2018.
- [6] L. Angermann. A general class of discretization methods for convection dominated elliptic problems on two- or three-dimensional domains. In L. Tobiska, editor, *Discretization methods of singular perturbations and flow problems*, pages 5–12. TU Magdeburg, 1989.
- [7] L. Angermann. A modified error estimator of Babuška-Rheinboldt’s type for singularly perturbed elliptic problems. In H.-G. Roos, A. Felgenhauer, and L. Angermann, editors, *Numerical methods in singularly perturbed problems*, pages 1–12. TU Dresden, 1991.
- [8] L. Angermann. A posteriori error estimates for FEM with violated Galerkin orthogonality. In H.-G. Bock, R. Rannacher, G. Kanschat, J. Schlöder, V. Schulz, and F.-T. Suttmeier, editors, *Adaptive finite element methods and optimization*, pages 1–9, Universität Heidelberg, 1998. IWR.
- [9] L. Angermann. Application and analysis of finite volume upwind stabilizations for the steady-state incompressible Navier-Stokes equations. In R. Vilsmeier, F. Benkhaldoun,

- and D. Hänel, editors, *Finite volumes for complex applications II – problems and perspectives*, pages 223–230, Paris, 1999. Hermes.
- [10] L. Angermann. The one-step  $\Theta$ -method for spatially stabilized finite volume discretizations of parabolic equations. In R. Herbin and D. Kröner, editors, *Finite volumes for complex applications III – problems and perspectives*, pages 25–39, London, 2002. Hermes Penton Science.
- [11] L. Angermann. *A posteriori* estimates for errors of functionals on finite volume approximations to solutions of elliptic boundary-value problems. In L. Beilina and Y.V. Shestopalov, editors, *Inverse Problems and Large-Scale Computations*, pages 57–68, New York-Heidelberg-Dordrecht-London, 2013. Springer-Verlag. Springer Proceedings in Mathematics & Statistics, vol. 52.
- [12] L. Angermann. Energy-stability of time-domain finite element solutions to Maxwell’s equations with cubic polarization. In M. Andriychuk, M. Antyufeyeva, and O. Bagatska, editors, *Proceedings of the 2022 IEEE 2nd Ukrainian Microwave Week (UkrMW)*, pages 444–448, Kharkiv, Ukraine, November 14–18, 2022. IEEE Catalog Number: CFP22X02-ART.
- [13] L. Angermann. Formulation and investigation of a mathematical model for resonance radiation on media with compactly supported nonlinearities. In *Proceedings of the XXVIth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2021)*, pages 3–6, Tbilisi, Georgia, September 8–10, 2021. Ivane Javakhishvili Tbilisi State University.
- [14] L. Angermann, Y.V. Shestopalov, Y.G. Smirnov, and V.V. Yatsyk. A nonlinear multi-parameter EV problem. In L. Beilina and Y.G. Smirnov, editors, *Nonlinear and Inverse Problems in Electromagnetics*, pages 55–70, New York-Heidelberg-Dordrecht-London, 2018. Springer-Verlag. Springer Proceedings in Mathematics & Statistics, vol. 243.
- [15] L. Angermann, Y.V. Shestopalov, and V.V. Yatsyk. Modeling and analysis of wave packet scattering and generation for a nonlinear layered structure. In E.M. Kiley and V.V. Yakovlev, editors, *Multiphysics Modeling in Microwave Power Engineering*, pages 21–26, University of Bayreuth, Germany, 2012. 14th Seminar Computer Modeling in Microwave Engineering and Applications, Bayreuth, March 5–6, 2012.
- [16] L. Angermann, Y.V. Shestopalov, and V.V. Yatsyk. Eigenmodes of linearised problems of scattering and generation of oscillations on cubically polarisable layers. In L. Beilina, editor, *Inverse Problems and Applications*, pages 67–80, New York-Heidelberg-Dordrecht-London, 2015. Springer-Verlag. Springer Proceedings in Mathematics & Statistics, vol. 120.
- [17] L. Angermann and S. Wang. A conforming exponentially fitted finite element method for the semiconductor continuity equations in 3d. *ZAMM*, 81(Supplement 3):S 755–S 756, 2001.
- [18] L. Angermann and V.V. Yatsyk. Controllable permittivities of decanalising nonlinear layers at frequencies of scattering and generation of energy. In *Proceedings of the*



- XVI International Symposium Discrete Singularities Methods in Mathematical Physics (DSMMPH-2013)*, Lazurnoe, Ukraine, June 10-15, 2013, pages 33–36, Kharkov-Kherson, Ukraine, 2013.
- [19] L. Angermann and V.V. Yatsyk. The eigenmodes and the energy of higher harmonics generated by decanalising layers. In *Proceedings of the XVI International Symposium Discrete Singularities Methods in Mathematical Physics (DSMMPH-2013)*, Lazurnoe, Ukraine, June 10-15, 2013, pages 29–32, Kharkov-Kherson, Ukraine, 2013.
- [20] L. Angermann and V.V. Yatsyk. Nonlinear layers with controllable permittivity at frequencies of scattering and generation. In *Proceedings of the Eighth International Kharkov Symposium on Physics and Engineering of Microwaves, Millimeter and Submillimeter Waves (MSMW 2013)*, June 23-28, 2013, pages 187–189, IEEE Xplore Digital Library, 2013. IEEE.
- [21] L. Angermann and V.V. Yatsyk. The relative Q-factor of the eigenmodes and the energy of higher harmonics generated by nonlinear layers. In *Proceedings of the Eighth International Kharkov Symposium on Physics and Engineering of Microwaves, Millimeter and Submillimeter Waves (MSMW 2013)*, June 23-28, 2013, pages 190–192, IEEE Xplore Digital Library, 2013. IEEE.
- [22] L. Angermann and V.V. Yatsyk. Scattering and generation properties on a nonlinear layer and eigen-modes of the linearized problems. In E.M. Kiley and V.V. Yakovlev, editors, *Multiphysics Models and Material Properties*, pages 40–44, KIT, Germany, 2014. 16th Seminar Computer Modeling in Microwave Power Engineering, Karlsruhe, May 12–13, 2014.
- [23] L. Angermann and V.V. Yatsyk. The numerical analysis of the multifunctional process of scattering and generation of oscillations by nonlinear layered media. In P.L. Tokarsky, editor, *X Anniversary International Conference on Antenna Theory and Techniques ICATT'2015*, pages 132–134. IEEE, 2015.
- [24] L. Angermann and V.V. Yatsyk. Energy balance laws for nonlinearly coupled fields in layered, cubically polarizable media. In *2020 IEEE Ukrainian Microwave Week, vol. 3: 2020 IEEE 10th International Kharkiv Symposium on Physics and Engineering of Microwaves, Millimeter and Submillimeter Waves (MSMW)*, Kharkiv, Ukraine, September 21–25, 2020, pages 704–707. IEEE, 2020.
- [25] L. Angermann and V.V. Yatsyk. The self-consistent problem of scattering and generation of waves by nonlinear layered media under the influence of weak fields at multiple frequencies. In I. Veliev, E. A.I. Nosich, and O.V. Shramkova, editors, *Proceedings of the 14th International Conference on Mathematical Methods in Electromagnetic Theory (MMET 2012)*, pages 382–385, Kharkov, Ukraine, August 28 - 30, 2012. IEEE.
- [26] L. Angermann and V.V. Yatsyk. Modeling and analysis of wave scattering and generation on cubically polarisable layered structures. In O.V. Motygin, A.S. Kirpichnikova, A.P. Kiselev, and M.V. Perel, editors, *Proceedings of the International Conference Days on Diffraction 2011 (DD-11)*, pages 21–26, St. Petersburg, Russia, May 30 - June 3, 2011. Steklov Institute of Mathematics.

- [27] L. Angermann and V.V. Yatsyk. Scattering and generation properties of cubically polarisable layers with negative and positive cubic susceptibility of the medium. In O.V. Motygin, A.S. Kirpichnikova, A.P. Kiselev, and M.V. Perel, editors, *Proceedings of the International Conference Days on Diffraction 2011 (DD-11)*, pages 27–32, St. Petersburg, Russia, May 30 - June 3, 2011. Steklov Institute of Mathematics.
- [28] L. Angermann and V.V. Yatsyk. Mathematical models for resonant radiation of plane wave packets on layered, cubically polarizable gratings – existence of solutions. In *Proceedings of the XXIVth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2019)*, pages 129–133, Lviv, Ukraine, September 12–14, 2019. Pidstryhach Institute for Applied Problems in Mechanics and Mathematics NASU.
- [29] L. Angermann and V.V. Yatsyk. Numerical simulation of the diffraction problem on a Kerr-type nonlinear layer. In *Proceedings of the XIIIth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2008)*, pages 138–142, Georgia, September 22–25, 2008. Tbilisi State University.
- [30] L. Angermann and V.V. Yatsyk. Eigenoscillations and energy generated by nonlinear cubically polarisable layers. In *Proceedings of the XVIIIth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2013)*, pages 24–27, Lviv, Ukraine, September 23–26, 2013. Pidstryhach Institute for Applied Problems in Mechanics and Mathematics NASU.
- [31] L. Angermann and V.V. Yatsyk. The excitation of a nonlinear layered medium by a packet of plane waves at multiple frequencies. In *Proceedings of the XVIIth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2012)*, pages 105–108, Georgia, September 24–27, 2012. Tbilisi State University.
- [32] L. Angermann and V.V. Yatsyk. Eigen-modes of the linearised problems of scattering and generation of waves on non-linear layers. In *Proceedings of the XVIth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2011)*, pages 82–85, Lviv, Ukraine, September 26–29, 2011. Ya.S. Pidstryhach Institute for Applied Problems of Mechanics and Mathematics.
- [33] L. Angermann and V.V. Yatsyk. Scattering and generation of waves on non-linear cubically polarisable dielectric layers. In *Proceedings of the XVIth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2011)*, pages 78–81, Lviv, Ukraine, September 26–29, 2011. Ya.S. Pidstryhach Institute for Applied Problems of Mechanics and Mathematics.
- [34] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Preset field approximation and self-consistent analysis of the scattering and generation of oscillations by a layered structure. In L. Beilina and Y.V. Shestopalov, editors, *Inverse Problems and Large-Scale Computations*, pages 41–56, New York-Heidelberg-Dordrecht-London, 2013. Springer-Verlag. Springer Proceedings in Mathematics & Statistics, vol. 52.

- [35] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The type-conversion of generated oscillations by decanalizing nonlinear layered media. In *Proceedings of the XVII International Symposium Discrete Singularities Methods in Mathematical Physics (DSMMPH-2015)*, Sumy, Ukraine, June 8-13, 2015, pages 20–23, Kharkiv, Ukraine, 2015.
- [36] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The type-conversion of scattered oscillations at the two-sided excitation of nonlinear layered structures. In *Proceedings of the XVII International Symposium Discrete Singularities Methods in Mathematical Physics (DSMMPH-2015)*, Sumy, Ukraine, June 8-13, 2015, pages 24–27, Kharkiv, Ukraine, 2015.
- [37] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Resonant scattering and third-harmonic generation by cubically polarizable grating structures. In *Proceedings of the 9-th International Kharkiv Symposium on Physics and Engineering of Microwaves, Millimeter and Submillimeter Waves (MSMW 2016)*, June 20-24, 2016, pages F–23, 1–4, IEEE Xplore Digital Library, 2016. IEEE.
- [38] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The dynamics of resonant scattering and generation of waves by a three-layer dielectric with a nonlinear medium. In *Proceedings of the XVIII International Symposium Discrete Singularities Methods in Mathematical Physics (DSMMPH-2017)*, Kharkiv, Ukraine, June 26-28, 2017, pages 10–13, Kharkiv, Ukraine, 2017.
- [39] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Generation properties of nonlinear layered objects and eigen-modes of the linearized problems. In *Proceedings of the 2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON)*, Kyiv, May 29 – June 2, 2017, pages 221–224. IEEE, 2017. IEEE Catalog Number: CFP17K03-USB.
- [40] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Generating properties of waves at the resonant frequencies of a transparent nonlinear layer. In *2019 IEEE 2nd Ukraine Conference on Electrical and Computer Engineering (UKRCON)*, Lviv, July 2–6, 2019, pages 153–156, Invited paper. IEEE, 2019.
- [41] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. A boundary-value problem of resonant scattering and generation of waves by nonlinear layered media. In V. Khardikov, editor, *Proceedings of the 7th International Conference “Ultrawideband and ultrashort impulse signals”*, pages 92–95, Kharkiv, Ukraine, September 15 - 19, 2014.
- [42] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Scattering and generation of waves by cubically polarisable layered media under the influence of weak fields. In V. Khardikov, editor, *Proceedings of the 6th International Conference “Ultrawideband and ultrashort impulse signals”*, pages 235–237, Sevastopol, Ukraine, September 17 - 21, 2012.
- [43] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The dynamics of type-conversion of oscillations by nonlinear layered media. In *Proceedings of the XXth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2015)*, pages 29–32, Lviv, Ukraine, September 21–24, 2015. Pidstryhach Institute for Applied Problems in Mechanics and Mathematics NASU.

- [44] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Multifunctional nonlinear layered media by resonant scattering and generation of waves. In *Proceedings of the XIXth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2014)*, pages 45–47, Tbilisi, Georgia, September 22–25, 2014. Pidstryhach Institute for Applied Problems in Mechanics and Mathematics NASU.
- [45] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Numerical specifics in nonlinear layer computation near eigen frequencies of scattering and generation. In *Proceedings of the XXIIIrd International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2018)*, pages 47–50, Tbilisi, Georgia, September 24–27, 2018. Ivane Javakhishvili Tbilisi State University.
- [46] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Methods for the analysis of wave scattering and generation by layered and periodic structures. In *Proceedings of the XXIIInd International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2017)*, pages 93–96, Dnipro, Ukraine, September 25–28, 2017. Oles Honchar Dnipro National University.
- [47] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Transparent cubically polarizable media with layered or periodic structures. In *Proceedings of the XXIst International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2016)*, pages 13–16, Tbilisi, Georgia, September 26–29, 2016. Ivane Javakhishvili Tbilisi State University.
- [48] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Generation and resonance scattering of waves on a cubically polarisable nonlinear dielectric layer. In *Proceedings of the XVth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory (DIPED-2010)*, pages 127–131, Georgia, September 27–30, 2010. Tbilisi State University.
- [49] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Computation of excitation frequencies for nonlinear wave scattering and generation processes. In M. Antyufeyeva and A. Butrym, editors, *Proceedings of the 9th International Conference “Ultrawideband and ultrashort impulse signals”*, pages 234–237, Odessa, Ukraine, September 4–7, 2018.
- [50] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. Resonant scattering and generation of oscillations for nonlinear layered and grating-like media. In V. Khardikov and M. Antyufeyeva, editors, *Proceedings of the 8th International Conference “Ultrawideband and ultrashort impulse signals”*, pages 105–108, Odessa, Ukraine, September 5–11, 2016.
- [51] L. Angermann, V.V. Yatsyk, and M.V. Yatsyk. The analysis of processes of generation and resonance scattering of waves on cubically polarisable layered structures. In *Proceedings of the 5th International Conference “Ultrawideband and ultrashort impulse signals”*, pages 68–71, Sevastopol, Ukraine, September 6 - 10, 2010. V.N. Karazin Kharkov National University.
- [52] J. Rang and L. Angermann. Perturbation index of linear partial differential-algebraic equations with a hyperbolic part. *PAMM*, 5(1):815–816, 2005. Proceedings of the GAMM Annual Meeting – Luxembourg 2005.

- [53] J. Rang and L. Angermann. New Rosenbrock methods of order 3 for PDAEs of index 2. In M. Fila, A. Handlovičová, K. Mikula, M. Medved, P. Quittner, and Ševcovič D., editors, *Proceedings of Equadiff 11, Proceedings of minisymposia and contributed talks, July 25-29, 2005, Bratislava*, pages 385–394, Bratislava, 2007. Vydavateľstvo STU.
- [54] L. Selimović and L. Angermann. A model problem for a weight optimization. In *Tagungsband 3. Niedersächsisches Symposium Materialtechnik*, pages 243–252, Aachen, 2019. Shaker Verlag.

### Bücher/Books

- [1] L. Angermann and B. Mulansky. *Analysis und Lineare Algebra I&II*. edition winterwork, Leipzig, 2018.
- [2] L. Angermann and B. Mulansky. *Grundkurs Analysis und Lineare Algebra*. Springer Spektrum, Berlin-Heidelberg, 2022. 2. Auflage.
- [3] L. Angermann and V.V. Yatsyk. *Resonant Scattering and Generation of Waves. Cubically Polarizable Layers*. Springer-Verlag, Cham, 2019.
- [4] P. Knabner and L. Angermann. *Numerik partieller Differentialgleichungen. Eine anwendungsorientierte Einführung*. Springer-Verlag, Heidelberg, 2000.
- [5] P. Knabner and L. Angermann. *Numerical methods for elliptic and parabolic partial differential equations*. Texts in Applied Mathematics, Vol. 44. Springer-Verlag, New York, 2003.
- [6] P. Knabner and L. Angermann. *Numerical methods for elliptic and parabolic partial differential equations*. Texts in Applied Mathematics, Vol. 44. Springer Nature, Cham, 2nd ext. and rev. edition, 2021.

### Herausgeberschaften/Books Edited

- [1] L. Angermann, editor. *Numerical Simulations – Examples and Applications in Computational Fluid Dynamics*, Rijeka/Vienna, Croatia/Austria, 2010. InTech.
- [2] L. Angermann, editor. *Numerical Simulations – Applications, Examples and Theory*, Rijeka/Vienna, Croatia/Austria, 2011. InTech.
- [3] L. Angermann, M. Stynes, and L. Tobiska, editors. *Numerical methods for transport-dominated and related problems*. *Computing* 66(2), 2001. (special issue).
- [4] H.-G. Roos, A. Felgenhauer, and L. Angermann, editors. *Numerical methods in singularly perturbed problems. Proceedings of the workshop International Seminar on Applied Mathematics (ISAM '91)*. TU Dresden, 1991.

**Sonstige Publikationen/Other Publications**

- [1] L. Angermann. Multifunktionale optische Materialien. *Technologieinformationen* 2: 22, 2019.
- [2] L. Angermann. Multifunktionale optische Materialien. *Wissen aus Hochschulen in Niedersachsen*, 2021.

**Vorlesungsausarbeitungen/Lecture Notes**

- [1] L. Angermann. Finite volume methods for processes in porous media. Ausarbeitung für eine Vorlesungsserie im Rahmen des Kompaktkurses “Numerische Prozess-Simulation in porösen Medien”, DFG-Graduiertenkolleg “Interaktion von Modellbildung, Numerik und Softwarekonzepten für technisch-wissenschaftliche Fragestellungen” des ICCES an der Universität Hannover, 2001.
- [2] L. Angermann. Einführung in die Programmsysteme “Maple” und “MATLAB”. Vorlesungsausarbeitung, TU Clausthal, 2004.
- [3] L. Angermann. Finite-Elemente-Methoden I+II. Vorlesungsausarbeitung (Inhaltliche Fortsetzung von “Finite-Elemente-Methoden”, aktuelle Version [11]), TU Clausthal, 2011.
- [4] L. Angermann. Parallele Numerik. Vorlesungsausarbeitung, TU Clausthal, 2011.
- [5] L. Angermann. Fouriertransformation, Distributionen und Sobolev-Räume. Vorlesungsausarbeitung, TU Clausthal, 2013.
- [6] L. Angermann. Ingenieur-Mathematik III: Einführung in die Numerische Mathematik für Studierende nichtmathematischer Studiengänge. Vorlesungsausarbeitung, TU Clausthal, 2013.
- [7] L. Angermann. Ingenieur-Mathematik IV: Numerik der Differentialgleichungen. Vorlesungsausarbeitung, TU Clausthal, 2014.
- [8] L. Angermann. Numerische Mathematik I. Vorlesungsausarbeitung, TU Clausthal, 2014.
- [9] L. Angermann. Elements of differential and computational geometry. Lecture Notes, Clausthal University of Technology, 2018.
- [10] L. Angermann. Numerische Mathematik II. Vorlesungsausarbeitung, TU Clausthal, 2020.
- [11] L. Angermann. Finite-Elemente-Methoden. Vorlesungsausarbeitung, TU Clausthal, 2021.
- [12] L. Angermann. Finite-Volumem-Methoden. Vorlesungsausarbeitung, TU Clausthal, 2021.

- [13] L. Angermann. Numerische Mathematik III. Vorlesungsausarbeitung, TU Clausthal, 2022.
- [14] L. Angermann. Vertiefung Analysis I+II. Vorlesungsausarbeitung, TU Clausthal, 2022.
- [15] L. Angermann. Partielle Differentialgleichungen. Vorlesungsausarbeitung, TU Clausthal, 2023.

### **Unveröffentlichte Manuskripte/Unpublished Manuscripts**

- [1] L. Angermann. An application of complementary variational principles to local error estimations for elliptic problems in the plane. Unpublished manuscript, 1990.
- [2] L. Angermann. Kriterien der Inversmonotonie von Matrizen. Unpublished manuscript, 1992.
- [3] L. Angermann. Zur Inversmonotonie eines diskreten Laplace-Operators. Unpublished manuscript, 1992.