

Literaturverzeichnis

- [Alt98] H. Altenbach, P. Deuring, K. Naumenko. A system of ordinary and partial differential equations describing creep behaviour of thin-walled shells. Technical Report 98-10, Martin-Luther-Universität Halle, Fachbereich Mathematik und Informatik, 1998.
- [Ans87] K.M. Anstreicher, U.G. Rotblum. Using Gauss-Jordan elimination to compute the index, generalized nullspace and Drazin inverse. *Linear Algebra Appl.*, 85:221–239, 1987.
- [Arn98a] M. Arnold. A note on the uniform perturbation index. Rostocker Math. Kolloquium, Heft 52, 1998.
- [Arn98b] M. Arnold. Zur Theorie und zur numerischen Lösung von Anfangswertproblemen für differentiell-algebraische Systeme vom höheren Index (Habilitationsschrift). Forschungsberichte des VDI Verlag Düsseldorf, Reihe 20, 1998.
- [Arn98c] M. Arnold, B. Simeon. The simulation of pantograph and catenary: a PDAE approach. TU Darmstadt, Fachbereich Mathematik, Preprint Nr. 1990, 1998.
- [Auz90] W. Auzinger. On error structures and extrapolation for stiff systems, with application in the method of lines. *Computing*, 44(4):331–356, 1990.
- [Bel84] R.E. Bellman. *The Laplace transform*. Robert S. Roth. - Singapore: World Scientific, 1984.
- [Bra65] R. Bracewell. *The Fourier transform and its applications*. New York [u.a.]: McGraw-Hill, 1965.
- [Bre89] K.E. Brenan, S.L. Campbell, L.R. Petzold. *Numerical solution of initial-value problems in differential-algebraic equations*. North-Holland Publ. Co., Amsterdam, 1989.
- [Cam76] S.L. Campbell, C.D. Meyer Jr., N.J. Rose. Applications of the Drazin inverse to linear systems of differential equations with singular constant coefficients. *SIAM J. Appl. Math.*, 31(3):411–425, November 1976.
- [Cam95] S.L. Campbell, C.W. Gear. The index of general nonlinear DAEs. *Numer. Math.*, 72:173–196, 1995.
- [Cam96a] S.L. Campbell, W. Marszalek. The index of an infinite dimensional implicit system. *Math. Mod. of Syst.*, 1(1):1–25, 1996.
- [Cam96b] S.L. Campbell, W. Marszalek. ODE/DAE integrators and MOL problems. *ZAMM*, 76:S1, 251–254, 1996.
- [Cam97] S.L. Campbell, W. Marszalek. DAEs arising from traveling wave solutions of PDEs. *J. Comput. Appl. Math.*, 82(1-2):41–58, 1997.
- [Can73] J.R. Cannon, R.E. Klein. On the observability and stability of the temperature distribution in a composite heat conductor. *SIAM J. Appl. Math.*, 24:596–602, 1973.
- [Cha70] Fung-Yual Chang. Transient analysis of lossless transmission lines in a nonhomogeneous dielectric medium. *IEEE Trans. Microwave Theory Tech.*, MIT-18:616–626, 1970.

- [Cro79] M. Crouzeix. Sur la B-stabilité des méthodes de Runge-Kutta. *Numer. Math.*, 32:75–82, 1979.
- [Dah59] G. Dahlquist. Stability and error bounds in the numerical integration of ordinary differential equations. *Trans. of Royal Inst. of Techn., No. 130, Stockholm*, 1959.
- [Dah85] G. Dahlquist. 33 years of numerical instability. I. *BIT*, 25:188–204, 1985.
- [Dek84] K. Dekker, J.G. Verwer. *Stability of Runge-Kutta methods for stiff nonlinear differential equations*. North Holland, 1984.
- [Deu94] P. Deuffhard, F. Bornemann. *Numerische Mathematik II: Integration gewöhnlicher Differentialgleichungen*. de Gruyter, Berlin, 1994.
- [Dor93] J.L.M. van Dorsselaer, J.F.B.M. Kraaijevanger, M.N Spijker. Linear stability analysis in the numerical solution of initial value problems. In A. Iserles, editor, *Acta Numerica*. Cambridge University Press, 1993.
- [Dou56] J. Douglas, H. H. Rachford. On the numerical solution of heat conduction problems in two and three space variables. *Trans. Amer. Math. Soc.*, 82:421–453, 1956.
- [Dou62] J. Douglas. Alternating direction method for three space variables. *Numer. Math.*, 4:41–63, 1962.
- [EL98a] C. Eichler-Liebenow, N.H. Cong, R. Weiner, K. Strehmel. Linearly implicit splitting methods for higher space-dimensional parabolic differential equations. *Appl. Numer. Math.*, 28:259–274, 1998.
- [EL98b] C. Eichler-Liebenow, P. J. van der Houwen, B. P. Sommeijer. Analysis of approximate factorization in iteration methods. *Appl. Numer. Math.*, 28:245–258, 1998.
- [ES98] E. Eich-Soellner, C. Führer. *Numerical methods in multibody dynamics*. B.G. Teubner Stuttgart, 1998.
- [Fra81] R. Frank, J. Schneid, C.W. Ueberhuber. The concept of B-convergence. *SIAM J. Numer. Anal.*, 18:753–780, 1981.
- [Gan86] F.R. Gantmacher. *Matrizentheorie*. VEB Deutscher Verlag der Wissenschaften, Berlin, 1986.
- [Gea88] C.W. Gear. Differential-algebraic index transformations. *SIAM J. Sci. Stat. Comp.*, 9:39–47, 1988.
- [Gea90] C.W. Gear. Differential-algebraic equations, indices, and integral algebraic equations. *SIAM J. Numer. Anal.*, 27:1527–1534, 1990.
- [Got77] D. Gottlieb, S.A. Orszag. Numerical analysis of spectral methods: theory and applications. *CBMS-NSF Regional Conference Series in Applied Mathematics*, No. 26, 1977.
- [Gri86] E. Griepentrog, R. März. *Differential-algebraic equations and their numerical treatment*. Teubner-Texte zur Mathematik, Band 88, Leipzig, 1986.
- [Gri96] P. Grindrod. *The theory and applications of reaction-diffusion equations*. Clarendon Press, Oxford, 1996.
- [Grö78] K. Gröger, M. Schleiff. Bestimmung der Temperaturverteilung in einem stromdurchflossenen Körper. *ZAMM*, 12:547–553, 1978.
- [Gro92] Ch. Großmann, H.-G. Roos. *Numerik partieller Differentialgleichungen*. B.G. Teubner, Stuttgart, 1992.
- [Gün98] Y. Günther, M. Wagner. Index Concepts for Linear Mixed Systems of Differential-Algebraic and Hyperbolic-Type Equations. Technical Report Preprint Nr. 2012, Technische Universität Darmstadt, Fachbereich Mathematik, 1998.

- [Hai82] E. Hairer, G. Bader, Ch. Lubich. On the stability of semi-implicit methods for ordinary differential equations. *BIT*, 22:211–232, 1982.
- [Hai89] E. Hairer, Ch. Lubich, M. Roche. *The numerical solution of differential-algebraic systems by Runge-Kutta methods*, volume 1409. Springer-Verlag, 1989. Lecture Notes in Mathematics.
- [Hai93] E. Hairer, S.P. Nørsett, G. Wanner. *Solving ordinary differential equations I*. Springer-Verlag, 1993.
- [Hai96] E. Hairer, G. Wanner. *Solving Ordinary Differential Equations II*. Springer-Verlag, 1996.
- [Hou79] P. J. van der Houwen, J. G. Verwer. One-Step Splitting Methods for Semi-Discrete Parabolic Equations. *Computing*, 22:291–309, 1979.
- [Hou97] P.J. van der Houwen, B.P. Sommeijer, J. Kok. The iterative solution of fully implicit discretizations of three-dimensional transport models. *Appl. Numer. Math.*, 25(2-3):243–256, 1997.
- [Hun89] W. H. Hundsdorfer, J. G. Verwer. Stability and Convergence of the Peaceman-Rachford ADI Method for Initial-Boundary Value Problems. *Mathematics of Computations*, 53(187):81–101, 1989.
- [Hun92] W. H. Hundsdorfer. Unconditional convergence of some Crank-Nicolson methods for initial-boundary value problems. *Math. Comput.*, 58(197):35–53, 1992.
- [Hun98a] W. Hundsdorfer. A note on stability of the Douglas splitting method. *Math. Comput.*, 67(221):183–190, 1998.
- [Hun98b] Hundsdorfer, Willem. Trapezoidal and midpoint splittings for initial-boundary value problems. *Math. Comput.*, 67(223):1047–1062, 1998.
- [Jod90] Jodar, Lucas. Computing accurate solutions for coupled systems of second order partial differential equations. *Int. J. Comput. Math.*, 37(3/4):201–212, 1990.
- [Jod91] L. Jodar, M. Legua Fernandez. An implicit difference method for the numerical solution of coupled systems of partial differential equations. *Appl. Math. Comput.*, 46(2):127–134, 1991.
- [Jor94] J.C. Jorge, F. Lisbona. Contractivity results for alternating direction schemes in Hilbert spaces. *Appl. Numer. Math.*, 15:65–75, 1994.
- [Kro90] L. Kronecker. Algebraische Reduktion der Schaaren bilinearer Formen. *Akad. der Wiss. Berlin*, Werke vol. III:141–155, 27. Nov. 1890.
- [Kun94] P. Kunkel, V. Mehrmann. Canonical forms for linear differential-algebraic equations with variable coefficients. *J. Comp. Appl. Math.*, 56:225–259, 1994.
- [Kun96] P. Kunkel, V. Mehrmann. Local and global invariants of linear differential-algebraic equations and their relation. *Electron. Trans. Numer. Anal.*, 4:138–157, 1996.
- [Leu89] A.W. Leung. *Systems of nonlinear partial differential equations*. Kluwer Acad. Publ., Dordrecht, Boston, London, 1989.
- [Lie94] C. Liebenow. Linear-implizite Splitting-Methoden für zweidimensionale parabolische Differentialgleichungen. Diplomarbeit, Martin-Luther-Universität Halle-Wittenberg, Fachbereich Mathematik und Informatik, 1994.
- [Lin97] Lin, Ping. A sequential regularization method for time-dependent incompressible Navier-Stokes equations. *SIAM J. Numer. Anal.*, 34(3):1051–1071, 1997.
- [Luc91] W. Lucht, Th. Radke. A model and a method for the determination of electric fields. In *Numerical treatment of differential equations (Halle,1989)*, S. 351–355. Teubner, Stuttgart, 1991.

- [Luc97a] W. Lucht, K. Strehmel, C. Eichler-Liebenow. Linear partial differential algebraic equations. Part I: Indexes, consistent boundary/initial conditions. Technical Report 97-17, Martin-Luther-Universität Halle, Fachbereich Mathematik und Informatik, 1997.
- [Luc97b] W. Lucht, K. Strehmel, C. Eichler-Liebenow. Linear partial differential algebraic equations. Part II: Numerical solution. Technical Report 97-18, Martin-Luther-Universität Halle, Fachbereich Mathematik und Informatik, 1997.
- [Luc98] W. Lucht, K. Strehmel. Discretization based indices for semilinear partial differential algebraic equations. *Appl. Numer. Math.*, 28:371–386, 1998.
- [Luc99] W. Lucht, K. Strehmel, C. Eichler-Liebenow. Indexes and special discretization methods for linear partial differential algebraic equations. *BIT*, 39(3):484–512, 1999.
- [Mar90] G. I. Marchuk. Splitting and alternating direction methods. In P. G. Ciarlet, J. L. Lions, editors, *Handbook of numerical analysis. Vol. I.*, S. 197–462. North-Holland Publishing Co., Amsterdam, 1990.
- [Mar97] W. Marszalek. *Analysis of partial differential algebraic equations*. Dissertationsschrift, North Carolina State University, Raleigh, 1997.
- [Mär98] R. März. EXTRA-ordinary differential equations: Attempts to an analysis of differential-algebraic systems. In A. et. al. Balog, editor, *European congress of mathematics (ECM), Budapest, Hungary, July 22-26, 1996*, volume I of *Prog. Math. 168*, S. 313–334. Basel: Birkhaeuser, 1998.
- [Mat86] E. J. W. ter Maten. Splitting methods for fourth order parabolic partial differential equations. *Computing*, 37(4):335–350, 1986.
- [Mei90] P. Meinhold, E. Wagner. *Partielle Differentialgleichungen*. Leipzig: BSB B.G. Teubner Verlagsgesellschaft, 1990.
- [Mit78] A.R. Mitchell, R. Wait. *The finite element methode in partial differential equations*. John Wiley & Sons, Chichester, 1978.
- [Mit80] A.R. Mitchell, D.F. Griffiths. *The finite difference methode in partial differential equations*. John Wiley & Sons, Chichester, 1980.
- [Naa72] J. Naas, H. L. Schmid. *Mathematisches Wörterbuch*. Akademie-Verlag GMBH Berlin, BSB B. G. Teubner Verlagsgesellschaft Leipzig, 1972.
- [Neu51] J. von Neumann. Eine Spektraltheorie für allgemeine Operatoren eines unitären Raumes. *Math. Nachr.*, 4:258–281, 1951.
- [Pea55] D. W. Peaceman, H. H. Jr. Rachford. The numerical solution of parabolic and elliptic differential equations. *J. Soc. Indust. Appl. Math.*, 3(1):March, 1955.
- [Pet82] L.R. Petzold. Differential-algebraic equations are not ODE's. *SIAM J. Sci. Stat. Comput.*, 3:367–384, 1982.
- [Pip90] K.G. Pipilis. *Higher order moving finite elements method for systems described by partial differential-algebraic equations*. Dissertationsschrift, Dept. of Chemical Engineering, Imperial College of Science, Technology and Medicine, 1990.
- [Ren96] P. Rentrop, K. Strehmel, R. Weiner. Ein Überblick über Einschrittverfahren zur numerischen Integration in der technischen Simulation. *GAMM-Mitteilungen*, 1:9 – 43, 1996.
- [Ric67] R. D. Richtmyer, K. W. Morton. *Difference methods for initial-value problems*. Interscience Publ., New York, 1967.
- [Sam84] A.A. Samarskij. *Theorie der Differenzenverfahren*. Akad. Verlagsgesellschaft Geest & Portig K.-G., Leipzig, 1984.

- [Sez87] M. Sezgin. Magnetohydrodynamic flow in a rectangular channel. *Internat. J. Numer. Methods Fluids*, 7:697–718, 1987.
- [Sha94] L. F. Shampine. ODE Solvers and the Method of Lines. *Numer. Methods Partial Differ. Equations*, 10:739–755, 1994.
- [She89] Qin Sheng. Solving linear partial differential equations by exponential splitting. *IMA Journal of Numerical Analysis*, 9:199–212, 1989.
- [She93] Qin Sheng. Global error estimates for exponential splitting. *IMA Journal of Numerical Analysis*, 14:27–56, 1993.
- [Sim93] B. Simeon, C. Führer, P. Rentrop. The Drazin inverse in multibody system dynamics. *Numer. Math.*, 64(4):521–539, 1993.
- [Sim96] B. Simeon. Modelling a flexible slider crank mechanism by a mixed system of DAEs and PDEs. *Math. Mod. of Syst.*, 2(1):1–18, 1996.
- [Smi58] W.L. Smirnov. *Lehrgang der höheren Mathematik. Teil IV*. Verlag der Wissenschaften, Berlin, 1958.
- [Söd92] G. Söderlind. Remarks on the stability of high-index DAEs with respect to parametric perturbations. *Computing*, 49:303–314, 1992.
- [SS86] J.M. Sanz-Serna, J.G. Verwer, W.H. Hundsdorfer. Convergence and order reduction of Runge-Kutta schemes applied to evolutionary problems in partial differential equations. *Numer. Math.*, 50:405–418, 1986.
- [Str92] K. Strehmel, R. Weiner. *Linear-implizite Runge-Kutta-Methoden und ihre Anwendung*. B.G. Teubner Stuttgart-Leipzig, 1992.
- [Str95] K. Strehmel, R. Weiner. *Numerik gewöhnlicher Differentialgleichungen*. B.G. Teubner Stuttgart-Leipzig, 1995.
- [Tho95] J.W. Thomas. *Numerical partial differential equations: Finite difference methods*. Springer, New York, 1995.
- [Ver84] J.G. Verwer, J.M. Sanz-Serna. Convergence of method of lines approximations to partial differential equations. *Computing*, 33:297–313, 1984.
- [Wal70] W. Walter. *Differential and Integral Inequalities*. Springer-Verlag New York, 1970.
- [War79] R.F. Warming, R.M. Beam. An extension of A-stability to alternating direction methods. *BIT*, 19:395–417, 1979.
- [Wei68] K. Weierstraß. Zur Theorie der bilinearen und quadratischen Formen. *Akad. der Wiss. Berlin*, Werke Vol. II:19–44, 18. Mai 1868.
- [Wei96] J. Weickert. Navier-Stokes equations as a differential-algebraic system. Preprint SFB 393/96-08, Technische Universität Chemnitz-Zwickau, 1996.
- [Wen98] J. Wensch. interne Diskussion. Martin-Luther-Universität Halle, Fachbereich Mathematik und Informatik, 1998.
- [Yan71] N. N. Yanenko. *The method of fractional steps*. Springer Berlin-Heidelberg-New York, 1971.