

An introduction to fractional calculus: fundamental ideas and numerics

– Bibliography –

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Βοιωτῶν μὲν Πηγέλεως καὶ Λῆίτος
ἡρχον Ἀρκεσίλαος τε Προθοήνωρ τε
Κλονίος τε, οἵ θ' Ὑρίην ἐνέμοντο καὶ
Αὐλίδα πετρήσσαν Σχοῖνόν τε
Σκῶλόν τε πολύκνημόν τ' Ἐτεωνόν,

Homer, Iliad II 494-497

The bibliography is divided by subject, like all divisions it is arbitrary and some items may be in one category rather than another. We tried to keep the division as close as possible to the content of the slides. The works are sorted in ascending order by year of publication and then by author's name.

Fractional Ordinary Differential Equations

- [You54] A. Young. "The application of approximate product integration to the numerical solution of integral equations". In: *Proc. Roy. Soc. London Ser. A* 224 (1954), pp. 561–573. ISSN: 0962-8444. DOI: [10.1098/rspa.1954.0180](https://doi.org/10.1098/rspa.1954.0180). URL: <https://doi.org/10.1098/rspa.1954.0180>.
- [DN68] M. M. Džrbašjan and A. B. Nersesjan. "Fractional derivatives and the Cauchy problem for differential equations of fractional order". In: *Izv. Akad. Nauk Armjan. SSR Ser. Mat.* 3.1 (1968), pp. 3–29. ISSN: 0002-3043.
- [CM85] R. F. Cameron and S. McKee. "The Analysis of Product Integration Methods for Abel's Equation using Discrete Fractional Differentiation". In: *IMA Journal of Numerical Analysis* 5.3 (July 1985), pp. 339–353. ISSN: 0272-4979. DOI: [10.1093/imanum/5.3.339](https://doi.org/10.1093/imanum/5.3.339). eprint: <https://academic.oup.com/imanum/article-pdf/5/3/339/2612709/5-3-339.pdf>. URL: <https://doi.org/10.1093/imanum/5.3.339>.

- [Dix85] J. Dixon. "On the order of the error in discretization methods for weakly singular second kind Volterra integral equations with nonsmooth solutions". In: *BIT* 25.4 (1985), pp. 624–634. ISSN: 0006-3835. DOI: [10.1007/BF01936141](https://doi.org/10.1007/BF01936141). URL: <https://doi.org/10.1007/BF01936141>.
- [HLS85] E. Hairer, C. Lubich, and M. Schlichte. "Fast numerical solution of nonlinear Volterra convolution equations". In: *SIAM J. Sci. Statist. Comput.* 6.3 (1985), pp. 532–541. ISSN: 0196-5204. DOI: [10.1137/0906037](https://doi.org/10.1137/0906037). URL: <https://doi.org/10.1137/0906037>.
- [Lin85] P. Linz. *Analytical and numerical methods for Volterra equations*. Vol. 7. SIAM Studies in Applied Mathematics. Society for Industrial and Applied Mathematics (SIAM), Philadelphia, PA, 1985, pp. xiii+227. ISBN: 0-89871-198-3. DOI: [10.1137/1.9781611970852](https://doi.org/10.1137/1.9781611970852). URL: <https://doi.org/10.1137/1.9781611970852>.
- [Lub86a] C. Lubich. "A stability analysis of convolution quadratures for Abel-Volterra integral equations". In: *IMA J. Numer. Anal.* 6.1 (1986), pp. 87–101. ISSN: 0272-4979. DOI: [10.1093/imanum/6.1.87](https://doi.org/10.1093/imanum/6.1.87). URL: <https://doi.org/10.1093/imanum/6.1.87>.
- [Lub86b] C. Lubich. "Discretized fractional calculus". In: *SIAM J. Math. Anal.* 17.3 (1986), pp. 704–719. ISSN: 0036-1410. DOI: [10.1137/0517050](https://doi.org/10.1137/0517050). URL: [http://doi.org/10.1137/0517050](https://doi.org/10.1137/0517050).
- [Sam95] S. G. Samko. "Fractional integration and differentiation of variable order". In: *Anal. Math.* 21.3 (1995), pp. 213–236. ISSN: 0133-3852. DOI: [10.1007/BF01911126](https://doi.org/10.1007/BF01911126). URL: <https://doi.org/10.1007/BF01911126>.
- [Die97] K. Diethelm. "An algorithm for the numerical solution of differential equations of fractional order". In: *Electron. Trans. Numer. Anal.* 5.Mar. (1997), pp. 1–6.
- [Pod99] I. Podlubny. *Fractional differential equations*. Vol. 198. Mathematics in Science and Engineering. An introduction to fractional derivatives, fractional differential equations, to methods of their solution and some of their applications. Academic Press, Inc., San Diego, CA, 1999, pp. xxiv+340. ISBN: 0-12-558840-2.
- [Cap01] M. Caputo. "Distributed order differential equations modelling dielectric induction and diffusion". In: *Fract. Calc. Appl. Anal.* 4.4 (2001), pp. 421–442. ISSN: 1311-0454.
- [FS01] N. J. Ford and A. C. Simpson. "The numerical solution of fractional differential equations: speed versus accuracy". In: *Numer. Algorithms* 26.4 (2001), pp. 333–346. ISSN: 1017-1398. DOI: [10.1023/A:1016601312158](https://doi.org/10.1023/A:1016601312158). URL: <https://doi.org/10.1023/A:1016601312158>.
- [DF02] K. Diethelm and N. J. Ford. "Analysis of fractional differential equations". In: *J. Math. Anal. Appl.* 265.2 (2002), pp. 229–248. ISSN: 0022-247X. DOI: [10.1006/jmaa.2000.7194](https://doi.org/10.1006/jmaa.2000.7194). URL: <https://doi.org/10.1006/jmaa.2000.7194>.

- [DFF02] K. Diethelm, N. J. Ford, and A. D. Freed. "A predictor-corrector approach for the numerical solution of fractional differential equations". In: vol. 29. 1-4. Fractional order calculus and its applications. 2002, pp. 3–22. DOI: [10.1023/A:1016592219341](https://doi.org/10.1023/A:1016592219341). URL: <https://doi.org/10.1023/A:1016592219341>.
- [Die03] K. Diethelm. "Efficient solution of multi-term fractional differential equations using P(EC)^mE methods". In: *Computing* 71.4 (2003), pp. 305–319. ISSN: 0010-485X. DOI: [10.1007/s00607-003-0033-3](https://doi.org/10.1007/s00607-003-0033-3). URL: <https://doi.org/10.1007/s00607-003-0033-3>.
- [DFF04] K. Diethelm, N. J. Ford, and A. D. Freed. "Detailed error analysis for a fractional Adams method". In: *Numer. Algorithms* 36.1 (2004), pp. 31–52. ISSN: 1017-1398. DOI: [10.1023/B:NUMA.0000027736.85078.be](https://doi.org/10.1023/B:NUMA.0000027736.85078.be). URL: <https://doi.org/10.1023/B:NUMA.0000027736.85078.be>.
- [SCK04] I. Sokolov, A. Chechkin, and J. Klafter. "Distributed-Order Fractional Kinetics". In: *Acta Physica Polonica. Series B* 35.4 (2004), pp. 1323–1341.
- [ABP05] T. M. Atanackovic, M. Budincevic, and S. Pilipovic. "On a fractional distributed-order oscillator". In: *J. Phys. A* 38.30 (2005), pp. 6703–6713. ISSN: 0305-4470. DOI: [10.1088/0305-4470/38/30/006](https://doi.org/10.1088/0305-4470/38/30/006). URL: <https://doi.org/10.1088/0305-4470/38/30/006>.
- [Die07] K. Diethelm. "Smoothness properties of solutions of Caputo-type fractional differential equations". In: *Fract. Calc. Appl. Anal.* 10.2 (2007), pp. 151–160. ISSN: 1311-0454.
- [Cap08] M. Caputo. "Linear models of dissipation whose Q is almost frequency independent. II". In: *Fract. Calc. Appl. Anal.* 11.1 (2008). Reprinted from *Geophys. J. R. Astr. Soc.* 13 (1967), no. 5, 529–539, pp. 4–14. ISSN: 1311-0454.
- [DF09] K. Diethelm and N. J. Ford. "Numerical analysis for distributed-order differential equations". In: *Journal of Computational and Applied Mathematics* 225.1 (2009), pp. 96–104. ISSN: 0377-0427. DOI: <https://doi.org/10.1016/j.cam.2008.07.018>. URL: <https://www.sciencedirect.com/science/article/pii/S0377042708003464>.
- [FC09] N. J. Ford and J. A. Connolly. "Systems-based decomposition schemes for the approximate solution of multi-term fractional differential equations". In: *J. Comput. Appl. Math.* 229.2 (2009), pp. 382–391. ISSN: 0377-0427. DOI: [10.1016/j.cam.2008.04.003](https://doi.org/10.1016/j.cam.2008.04.003). URL: <https://doi.org/10.1016/j.cam.2008.04.003>.
- [Die10] K. Diethelm. *The analysis of fractional differential equations*. Vol. 2004. Lecture Notes in Mathematics. An application-oriented exposition using differential operators of Caputo type. Springer-Verlag, Berlin, 2010, pp. viii+247. ISBN: 978-3-642-14573-5. DOI: [10.1007/978-3-642-14574-2](https://doi.org/10.1007/978-3-642-14574-2). URL: <https://doi.org/10.1007/978-3-642-14574-2>.

- [GP11] R. Garrappa and M. Popolizio. “On accurate product integration rules for linear fractional differential equations”. In: *J. Comput. Appl. Math.* 235.5 (2011), pp. 1085–1097. ISSN: 0377-0427. DOI: [10.1016/j.cam.2010.07.008](https://doi.org/10.1016/j.cam.2010.07.008). URL: <https://doi.org/10.1016/j.cam.2010.07.008>.
- [Gar15b] R. Garrappa. “Trapezoidal methods for fractional differential equations: theoretical and computational aspects”. In: *Math. Comput. Simulation* 110 (2015), pp. 96–112. ISSN: 0378-4754. DOI: [10.1016/j.matcom.2013.09.012](https://doi.org/10.1016/j.matcom.2013.09.012). URL: <https://doi.org/10.1016/j.matcom.2013.09.012>.
- [Gar18] R. Garrappa. “Numerical solution of fractional differential equations: A survey and a software tutorial”. In: *Mathematics* 6.2 (2018), p. 16.
- [Dur19] F. Durastante. “Efficient solution of time-fractional differential equations with a new adaptive multi-term discretization of the generalized Caputo-Dzherbashyan derivative”. In: *Calcolo* 56.4 (2019), Paper No. 36, 24. ISSN: 0008-0624. DOI: [10.1007/s10092-019-0329-0](https://doi.org/10.1007/s10092-019-0329-0). URL: <https://doi.org/10.1007/s10092-019-0329-0>.
- [Fis19] M. Fischer. “Fast and parallel Runge-Kutta approximation of fractional evolution equations”. In: *SIAM J. Sci. Comput.* 41.2 (2019), A927–A947. ISSN: 1064-8275. DOI: [10.1137/18M1175616](https://doi.org/10.1137/18M1175616). URL: <https://doi.org/10.1137/18M1175616>.
- [GGM21] R. Garrappa, A. Giusti, and F. Mainardi. “Variable-order fractional calculus: a change of perspective”. In: *Commun. Nonlinear Sci. Numer. Simul.* 102 (2021), Paper No. 105904, 16. ISSN: 1007-5704. DOI: [10.1016/j.cnsns.2021.105904](https://doi.org/10.1016/j.cnsns.2021.105904). URL: <https://doi.org/10.1016/j.cnsns.2021.105904>.

Fractional Partial Differential Equations

- [Grü67] A. K. Grünwald. “Über “begrenzte” Derivationen und deren Anwendung”. In: *Zangew Math und Phys* 12 (1867), pp. 441–480.
- [Let68] A. V. Letnikov. *Theory of differentiation with an arbitrary index*. 1868.
- [MT04] M. M. Meerschaert and C. Tadjeran. “Finite difference approximations for fractional advection-dispersion flow equations”. In: *J. Comput. Appl. Math.* 172.1 (2004), pp. 65–77. ISSN: 0377-0427. DOI: [10.1016/j.cam.2004.01.033](https://doi.org/10.1016/j.cam.2004.01.033). URL: <https://doi.org/10.1016/j.cam.2004.01.033>.
- [Ili+05] M. Ilic, F. Liu, I. Turner, and V. Anh. “Numerical approximation of a fractional-in-space diffusion equation. I”. In: *Fract. Calc. Appl. Anal.* 8.3 (2005), pp. 323–341. ISSN: 1311-0454.
- [Ili+06] M. Ilic, F. Liu, I. Turner, and V. Anh. “Numerical approximation of a fractional-in-space diffusion equation. II. With nonhomogeneous boundary conditions”. In: *Fract. Calc. Appl. Anal.* 9.4 (2006), pp. 333–349. ISSN: 1311-0454.

- [And+10] F. Andreu-Vaillo, J. M. Mazón, J. D. Rossi, and J. J. Toledo-Melero. *Non-local diffusion problems*. Vol. 165. Mathematical Surveys and Monographs. American Mathematical Society, Providence, RI; Real Sociedad Matemática Española, Madrid, 2010, pp. xvi+256. ISBN: 978-0-8218-5230-9. DOI: [10.1090/surv/165](https://doi.org/10.1090/surv/165). URL: <https://doi.org/10.1090/surv/165>.
- [Fer13] R. A. C. Ferreira. “A Lyapunov-type inequality for a fractional boundary value problem”. In: *Fract. Calc. Appl. Anal.* 16.4 (2013), pp. 978–984. ISSN: 1311-0454. DOI: [10.2478/s13540-013-0060-5](https://doi.org/10.2478/s13540-013-0060-5). URL: <https://doi.org/10.2478/s13540-013-0060-5>.
- [LS13] S.-L. Lei and H.-W. Sun. “A circulant preconditioner for fractional diffusion equations”. In: *J. Comput. Phys.* 242 (2013), pp. 715–725. ISSN: 0021-9991. DOI: [10.1016/j.jcp.2013.02.025](https://doi.org/10.1016/j.jcp.2013.02.025). URL: <https://doi.org/10.1016/j.jcp.2013.02.025>.
- [MN14] R. Musina and A. I. Nazarov. “On fractional Laplacians”. In: *Comm. Partial Differential Equations* 39.9 (2014), pp. 1780–1790. ISSN: 0360-5302. DOI: [10.1080/03605302.2013.864304](https://doi.org/10.1080/03605302.2013.864304). URL: <https://doi.org/10.1080/03605302.2013.864304>.
- [Pan+14] J. Pan, R. Ke, M. K. Ng, and H.-W. Sun. “Preconditioning techniques for diagonal-times-Toeplitz matrices in fractional diffusion equations”. In: *SIAM J. Sci. Comput.* 36.6 (2014), A2698–A2719. ISSN: 1064-8275. DOI: [10.1137/130931795](https://doi.org/10.1137/130931795). URL: <https://doi.org/10.1137/130931795>.
- [BP15] A. Bonito and J. E. Pasciak. “Numerical approximation of fractional powers of elliptic operators”. In: *Math. Comp.* 84.295 (2015), pp. 2083–2110. ISSN: 0025-5718. DOI: [10.1090/S0025-5718-2015-02937-8](https://doi.org/10.1090/S0025-5718-2015-02937-8). URL: <https://doi.org/10.1090/S0025-5718-2015-02937-8>.
- [Gu+15] X.-M. Gu, T.-Z. Huang, X.-L. Zhao, H.-B. Li, and L. Li. “Strang-type preconditioners for solving fractional diffusion equations by boundary value methods”. In: *J. Comput. Appl. Math.* 277 (2015), pp. 73–86. ISSN: 0377-0427. DOI: [10.1016/j.cam.2014.08.011](https://doi.org/10.1016/j.cam.2014.08.011). URL: <https://doi.org/10.1016/j.cam.2014.08.011>.
- [Jin+15] B. Jin, R. Lazarov, J. Pasciak, and W. Rundell. “Variational formulation of problems involving fractional order differential operators”. In: *Math. Comp.* 84.296 (2015), pp. 2665–2700. ISSN: 0025-5718. DOI: [10.1090/mcom/2960](https://doi.org/10.1090/mcom/2960). URL: <https://doi.org/10.1090/mcom/2960>.
- [BSS16] T. Breiten, V. Simoncini, and M. Stoll. “Low-rank solvers for fractional differential equations”. In: *Electron. Trans. Numer. Anal.* 45 (2016), pp. 107–132.
- [DMS16] M. Donatelli, M. Mazza, and S. Serra-Capizzano. “Spectral analysis and structure preserving preconditioners for fractional diffusion equations”. In: *J. Comput. Phys.* 307 (2016), pp. 262–279. ISSN: 0021-9991. DOI: [10.1016/j.jcp.2015.11.061](https://doi.org/10.1016/j.jcp.2015.11.061). URL: <https://doi.org/10.1016/j.jcp.2015.11.061>.

- [Kwa17] M. Kwaśnicki. "Ten equivalent definitions of the fractional Laplace operator". In: *Fract. Calc. Appl. Anal.* 20.1 (2017), pp. 7–51. ISSN: 1311-0454. DOI: [10.1515/fca-2017-0002](https://doi.org/10.1515/fca-2017-0002). URL: <https://doi.org/10.1515/fca-2017-0002>.
- [AN18] L. Aceto and P. Novati. "Efficient implementation of rational approximations to fractional differential operators". In: *J. Sci. Comput.* 76.1 (2018), pp. 651–671. ISSN: 0885-7474. DOI: [10.1007/s10915-017-0633-2](https://doi.org/10.1007/s10915-017-0633-2). URL: <https://doi.org/10.1007/s10915-017-0633-2>.
- [BD18] D. Bertaccini and F. Durastante. "Limited memory block preconditioners for fast solution of fractional partial differential equations". In: *J. Sci. Comput.* 77.2 (2018), pp. 950–970. ISSN: 0885-7474. DOI: [10.1007/s10915-018-0729-3](https://doi.org/10.1007/s10915-018-0729-3). URL: <https://doi.org/10.1007/s10915-018-0729-3>.
- [Ace+19] L. Aceto, D. Bertaccini, F. Durastante, and P. Novati. "Rational Krylov methods for functions of matrices with applications to fractional partial differential equations". In: *J. Comput. Phys.* 396 (2019), pp. 470–482. ISSN: 0021-9991. DOI: [10.1016/j.jcp.2019.07.009](https://doi.org/10.1016/j.jcp.2019.07.009). URL: <https://doi.org/10.1016/j.jcp.2019.07.009>.
- [AN19] L. Aceto and P. Novati. "Rational approximations to fractional powers of self-adjoint positive operators". In: *Numer. Math.* 143.1 (2019), pp. 1–16. ISSN: 0029-599X. DOI: [10.1007/s00211-019-01048-4](https://doi.org/10.1007/s00211-019-01048-4). URL: <https://doi.org/10.1007/s00211-019-01048-4>.
- [BD19] D. Bertaccini and F. Durastante. "Block structured preconditioners in tensor form for the all-at-once solution of a finite volume fractional diffusion equation". In: *Appl. Math. Lett.* 95 (2019), pp. 92–97. ISSN: 0893-9659. DOI: [10.1016/j.aml.2019.03.028](https://doi.org/10.1016/j.aml.2019.03.028). URL: <https://doi.org/10.1016/j.aml.2019.03.028>.
- [MMR19] S. Massei, M. Mazza, and L. Robol. "Fast solvers for two-dimensional fractional diffusion equations using rank structured matrices". In: *SIAM J. Sci. Comput.* 41.4 (2019), A2627–A2656. ISSN: 1064-8275. DOI: [10.1137/18M1180803](https://doi.org/10.1137/18M1180803). URL: <https://doi.org/10.1137/18M1180803>.
- [Har+20] S. Harizanov, R. Lazarov, S. Margenov, P. Marinov, and J. Pasciak. "Analysis of numerical methods for spectral fractional elliptic equations based on the best uniform rational approximation". In: *J. Comput. Phys.* 408 (2020), pp. 109285, 21. ISSN: 0021-9991. DOI: [10.1016/j.jcp.2020.109285](https://doi.org/10.1016/j.jcp.2020.109285). URL: <https://doi.org/10.1016/j.jcp.2020.109285>.
- [Lis+20] A. Lischke, G. Pang, M. Gulian, and et al. "What is the fractional Laplacian? A comparative review with new results". In: *J. Comput. Phys.* 404 (2020), pp. 109009, 62. ISSN: 0021-9991. DOI: [10.1016/j.jcp.2019.109009](https://doi.org/10.1016/j.jcp.2019.109009). URL: <https://doi.org/10.1016/j.jcp.2019.109009>.

- [MR21] S. Massei and L. Robol. “Rational Krylov for Stieltjes matrix functions: convergence and pole selection”. In: *BIT* 61.1 (2021), pp. 237–273. ISSN: 0006-3835. DOI: [10.1007/s10543-020-00826-z](https://doi.org/10.1007/s10543-020-00826-z). URL: <https://doi.org/10.1007/s10543-020-00826-z>.
- [AN22] L. Aceto and P. Novati. “Fast and accurate approximations to fractional powers of operators”. In: *IMA J. Numer. Anal.* 42.2 (2022), pp. 1598–1622. ISSN: 0272-4979. DOI: [10.1093/imanum/drab002](https://doi.org/10.1093/imanum/drab002). URL: <https://doi.org/10.1093/imanum/drab002>.
- [BS22] M. Benzi and I. Simunec. “Rational Krylov methods for fractional diffusion problems on graphs”. In: *BIT* 62.2 (2022), pp. 357–385. ISSN: 0006-3835. DOI: [10.1007/s10543-021-00881-0](https://doi.org/10.1007/s10543-021-00881-0). URL: <https://doi.org/10.1007/s10543-021-00881-0>.

Connection with random walks

- [MK00] R. Metzler and J. Klafter. “The random walk’s guide to anomalous diffusion: a fractional dynamics approach”. In: *Phys. Rep.* 339.1 (2000), p. 77. ISSN: 0370-1573. DOI: [10.1016/S0370-1573\(00\)00070-3](https://doi.org/10.1016/S0370-1573(00)00070-3). URL: [http://doi.org/10.1016/S0370-1573\(00\)00070-3](https://doi.org/10.1016/S0370-1573(00)00070-3).
- [SK05] I. M. Sokolov and J. Klafter. “From diffusion to anomalous diffusion: a century after Einstein’s Brownian motion”. In: *Chaos* 15.2 (2005), pp. 026103, 7. ISSN: 1054-1500. DOI: [10.1063/1.1860472](https://doi.org/10.1063/1.1860472). URL: <https://doi.org/10.1063/1.1860472>.

Mittag-Leffler function

- [TWS06] L. N. Trefethen, J. A. C. Weideman, and T. Schmelzer. “Talbot quadratures and rational approximations”. In: *BIT* 46.3 (2006), pp. 653–670. ISSN: 0006-3835. DOI: [10.1007/s10543-006-0077-9](https://doi.org/10.1007/s10543-006-0077-9). URL: <https://doi.org/10.1007/s10543-006-0077-9>.
- [Wei06] J. A. C. Weideman. “Optimizing Talbot’s contours for the inversion of the Laplace transform”. In: *SIAM J. Numer. Anal.* 44.6 (2006), pp. 2342–2362. ISSN: 0036-1429. DOI: [10.1137/050625837](https://doi.org/10.1137/050625837). URL: <https://doi.org/10.1137/050625837>.
- [WT07] J. A. C. Weideman and L. N. Trefethen. “Parabolic and hyperbolic contours for computing the Bromwich integral”. In: *Math. Comp.* 76.259 (2007), pp. 1341–1356. ISSN: 0025-5718. DOI: [10.1090/S0025-5718-07-01945-X](https://doi.org/10.1090/S0025-5718-07-01945-X). URL: <https://doi.org/10.1090/S0025-5718-07-01945-X>.
- [MN11] I. Moret and P. Novati. “On the convergence of Krylov subspace methods for matrix Mittag-Leffler functions”. In: *SIAM J. Numer. Anal.* 49.5 (2011), pp. 2144–2164. ISSN: 0036-1429. DOI: [10.1137/080738374](https://doi.org/10.1137/080738374). URL: <https://doi.org/10.1137/080738374>.

- [Gor+14] R. Gorenflo, A. A. Kilbas, F. Mainardi, and S. V. Rogosin. *Mittag-Leffler Functions, Related Topics and Applications*. Springer Monographs in Mathematics. Springer, Heidelberg, 2014, pp. xiv+443. ISBN: 978-3-662-43929-6. DOI: [10.1007/978-3-662-43930-2](https://doi.org/10.1007/978-3-662-43930-2).
- [TW14] L. N. Trefethen and J. A. C. Weideman. “The exponentially convergent trapezoidal rule”. In: *SIAM Rev.* 56.3 (2014), pp. 385–458. ISSN: 0036-1445. DOI: [10.1137/130932132](https://doi.org/10.1137/130932132). URL: <https://doi.org/10.1137/130932132>.
- [DW15] B. Dingfelder and J. A. C. Weideman. “An improved Talbot method for numerical Laplace transform inversion”. In: *Numer. Algorithms* 68.1 (2015), pp. 167–183. ISSN: 1017-1398. DOI: [10.1007/s11075-014-9895-z](https://doi.org/10.1007/s11075-014-9895-z). URL: <https://doi.org/10.1007/s11075-014-9895-z>.
- [Gar15a] R. Garrappa. “Numerical evaluation of two and three parameter Mittag-Leffler functions”. In: *SIAM J. Numer. Anal.* 53.3 (2015), pp. 1350–1369. ISSN: 0036-1429. DOI: [10.1137/140971191](https://doi.org/10.1137/140971191). URL: <https://doi.org/10.1137/140971191>.
- [GP18] R. Garrappa and M. Popolizio. “Computing the matrix Mittag-Leffler function with applications to fractional calculus”. In: *J. Sci. Comput.* 77.1 (2018), pp. 129–153. ISSN: 0885-7474. DOI: [10.1007/s10915-018-0699-5](https://doi.org/10.1007/s10915-018-0699-5). URL: <https://doi.org/10.1007/s10915-018-0699-5>.
- [MN19] I. Moret and P. Novati. “Krylov subspace methods for functions of fractional differential operators”. In: *Math. Comp.* 88.315 (2019), pp. 293–312. ISSN: 0025-5718. DOI: [10.1090/mcom/3332](https://doi.org/10.1090/mcom/3332). URL: <https://doi.org/10.1090/mcom/3332>.
- [HL21] N. J. Higham and X. Liu. “A multiprecision derivative-free Schur-Parlett algorithm for computing matrix functions”. In: *SIAM J. Matrix Anal. Appl.* 42.3 (2021), pp. 1401–1422. ISSN: 0895-4798. DOI: [10.1137/20M1365326](https://doi.org/10.1137/20M1365326). URL: <https://doi.org/10.1137/20M1365326>.

Toeplitz, circulant and other structured matrices

- [Lev46] N. Levinson. “The Wiener (root mean square) error criterion in filter design and prediction”. In: *J. Math. Phys.* 25.1 (1946), pp. 261–278.
- [Tre64] W. F. Trench. “An algorithm for the inversion of finite Toeplitz matrices”. In: *SIAM J. Appl. Math.* 12.3 (1964), pp. 515–522.
- [GS72] I. C. Gohberg and A. A. Semencul. “The inversion of finite Toeplitz matrices and their continual analogues”. In: *Mat. Issled.* 7.2(24) (1972), pp. 201–223, 290. ISSN: 0542-9994.
- [Zoh74] S. Zohar. “The solution of a Toeplitz set of linear equations”. In: *J. Assoc. Comput. Mach.* 21.2 (1974), pp. 272–276.

- [BA80] R. R. Bitmead and B. D. Anderson. "Asymptotically fast solution of Toeplitz and related systems of linear equations". In: *Linear Algebra Appl.* 34 (1980), pp. 103–116.
- [BGY80] R. P. Brent, F. G. Gustavson, and D. Y. Yun. "Fast solution of Toeplitz systems of equations and computation of Padé approximants". In: *J. Algorithms* 1.3 (1980), pp. 259–295.
- [Par86] S. V. Parter. "On the distribution of the singular values of Toeplitz matrices". In: *Linear Algebra Appl.* 80 (1986), pp. 115–130.
- [Hoo87] F. de Hoog. "A new algorithm for solving Toeplitz systems of equations". In: *Linear Algebra Appl.* 88 (1987), pp. 123–138.
- [AG88] G. S. Ammar and W. B. Gragg. "Superfast solution of real positive definite Toeplitz systems". In: *SIAM J. Matrix Anal. Appl.* 9.1 (1988), pp. 61–76.
- [Avr88] F. Avram. "On bilinear forms in Gaussian random variables and Toeplitz matrices". In: *Probab. Theory Related Fields* 79.1 (1988), pp. 37–45.
- [CY92] R. H. Chan and M.-C. Yeung. "Circulant preconditioners constructed from kernels". In: *SIAM J. Numer. Anal.* 29.4 (1992), pp. 1093–1103. ISSN: 0036-1429. DOI: [10.1137/0729066](https://doi.org/10.1137/0729066). URL: <https://doi.org/10.1137/0729066>.
- [CH92] T. F. Chan and P. C. Hansen. "A look-ahead Levinson algorithm for general Toeplitz systems". In: *IEEE Transactions on signal processing* 40.5 (1992), pp. 1079–1090.
- [CN93] R. H. Chan and K.-P. Ng. "Toeplitz preconditioners for Hermitian Toeplitz systems". In: *Linear Algebra Appl.* 190 (1993), pp. 181–208. ISSN: 0024-3795. DOI: [10.1016/0024-3795\(93\)90226-E](https://doi.org/10.1016/0024-3795(93)90226-E). URL: [https://doi.org/10.1016/0024-3795\(93\)90226-E](https://doi.org/10.1016/0024-3795(93)90226-E).
- [Ser95] S. Serra. "New PCG based algorithms for the solution of Hermitian Toeplitz systems". In: *Calcolo* 32.3-4 (1995), 153–176 (1997). ISSN: 0008-0624. DOI: [10.1007/BF02575833](https://doi.org/10.1007/BF02575833). URL: <https://doi.org/10.1007/BF02575833>.
- [CN96] R. H. Chan and M. K. Ng. "Conjugate gradient methods for Toeplitz systems". In: *SIAM Rev.* 38.3 (1996), pp. 427–482. ISSN: 0036-1445. DOI: [10.1137/S0036144594276474](https://doi.org/10.1137/S0036144594276474). URL: <https://doi.org/10.1137/S0036144594276474>.
- [Tyr96] E. E. Tyrtyshnikov. "A unifying approach to some old and new theorems on distribution and clustering". In: *Linear Algebra Appl.* 232 (1996), pp. 1–43.
- [Til98] P. Tilli. "Locally Toeplitz sequences: spectral properties and applications". In: *Linear Algebra Appl.* 278.1-3 (1998), pp. 91–120. ISSN: 0024-3795. DOI: [10.1016/S0024-3795\(97\)10079-9](https://doi.org/10.1016/S0024-3795(97)10079-9). URL: [https://doi.org/10.1016/S0024-3795\(97\)10079-9](https://doi.org/10.1016/S0024-3795(97)10079-9).

- [BM99] D. A. Bini and B. Meini. "Effective methods for solving banded Toeplitz systems". In: *SIAM J. Matrix Anal. Appl.* 20.3 (1999), pp. 700–719. ISSN: 0895-4798. DOI: [10.1137/S0895479897324585](https://doi.org/10.1137/S0895479897324585). URL: <https://doi.org/10.1137/S0895479897324585>.
- [ST99] S. Serra Capizzano and E. Tyrtyshnikov. "Any circulant-like preconditioner for multilevel matrices is not superlinear". In: *SIAM J. Matrix Anal. Appl.* 21.2 (1999), pp. 431–439. ISSN: 0895-4798. DOI: [10.1137/S089547989731941](https://doi.org/10.1137/S089547989731941). URL: <https://doi.org/10.1137/S089547989731941>.
- [Ber00] D. Bertaccini. "A circulant preconditioner for the systems of LMF-based ODE codes". In: *SIAM J. Sci. Comput.* 22.3 (2000), pp. 767–786. ISSN: 1064-8275. DOI: [10.1137/S1064827599353476](https://doi.org/10.1137/S1064827599353476). URL: <https://doi.org/10.1137/S1064827599353476>.
- [Ber01] D. Bertaccini. "Reliable preconditioned iterative linear solvers for some numerical integrators". In: *Numer. Linear Algebra Appl.* 8.2 (2001), pp. 111–125. ISSN: 1070-5325. DOI: [10.1002/1099-1506\(200103\)8:2<111::AID-NLA234>3.0.CO;2-Q](https://doi.org/10.1002/1099-1506(200103)8:2<111::AID-NLA234>3.0.CO;2-Q). URL: [https://doi.org/10.1002/1099-1506\(200103\)8:2<111::AID-NLA234>3.0.CO;2-Q](https://doi.org/10.1002/1099-1506(200103)8:2<111::AID-NLA234>3.0.CO;2-Q).
- [BN01] D. Bertaccini and M. K. Ng. "The convergence rate of block preconditioned systems arising from LMF-based ODE codes". In: *BIT* 41.3 (2001), pp. 433–450. ISSN: 0006-3835. DOI: [10.1023/A:1021906926616](https://doi.org/10.1023/A:1021906926616). URL: <https://doi.org/10.1023/A:1021906926616>.
- [GS01] U. Grenander and G. Szegö. *Toeplitz forms and their applications*. Vol. 321. University of California Press, 2001.
- [CNY02] R. H. Chan, M. K. Ng, and A. M. Yip. "The best circulant preconditioners for Hermitian Toeplitz systems. II. The multiple-zero case". In: *Numer. Math.* 92.1 (2002), pp. 17–40. ISSN: 0029-599X. DOI: [10.1007/s002110100354](https://doi.org/10.1007/s002110100354). URL: <https://doi.org/10.1007/s002110100354>.
- [ORS10] K. A. Okoudjou, L. G. Rogers, and R. S. Strichartz. "Szegö limit theorems on the Sierpiński gasket". In: *J. Fourier Anal. Appl.* 16.3 (2010), pp. 434–447. ISSN: 1069-5869. DOI: [10.1007/s00041-009-9102-0](https://doi.org/10.1007/s00041-009-9102-0). URL: <https://doi.org/10.1007/s00041-009-9102-0>.
- [GS17] C. Garoni and S. Serra-Capizzano. *Generalized locally Toeplitz sequences: theory and applications. Vol. I*. Springer, Cham, 2017, pp. xi+312. ISBN: 978-3-319-53678-1; 978-3-319-53679-8. DOI: [10.1007/978-3-319-53679-8](https://doi.org/10.1007/978-3-319-53679-8). URL: <https://doi.org/10.1007/978-3-319-53679-8>.
- [GS18] C. Garoni and S. Serra-Capizzano. *Generalized locally Toeplitz sequences: theory and applications. Vol. II*. Springer, Cham, 2018, pp. xi+194. ISBN: 978-3-030-02232-7; 978-3-030-02233-4. DOI: [10.1007/978-3-030-02233-4](https://doi.org/10.1007/978-3-030-02233-4). URL: <https://doi.org/10.1007/978-3-030-02233-4>.

HODLR and other hierarchical matrices

- [Tyr00] E. E. Tyrtyshnikov. "Incomplete cross approximation in the mosaic-skeleton method". In: vol. 64. 4. International GAMM-Workshop on Multigrid Methods (Bonn, 1998). 2000, pp. 367–380. DOI: [10.1007/s006070070031](https://doi.org/10.1007/s006070070031). URL: <https://doi.org/10.1007/s006070070031>.
- [CCG05] O. A. Carvajal, F. W. Chapman, and K. O. Geddes. "Hybrid symbolic-numeric integration in multiple dimensions via tensor-product series". In: *Proceedings of the 2005 international symposium on Symbolic and algebraic computation*. 2005, pp. 84–91.
- [Fie10] M. Fiedler. "Notes on Hilbert and Cauchy matrices". In: *Linear Algebra Appl.* 432.1 (2010), pp. 351–356. ISSN: 0024-3795. DOI: [10.1016/j.laa.2009.08.014](https://doi.org/10.1016/j.laa.2009.08.014). URL: <https://doi.org/10.1016/j.laa.2009.08.014>.
- [HMT11] N. Halko, P. G. Martinsson, and J. A. Tropp. "Finding structure with randomness: probabilistic algorithms for constructing approximate matrix decompositions". In: *SIAM Rev.* 53.2 (2011), pp. 217–288. ISSN: 0036-1445. DOI: [10.1137/090771806](https://doi.org/10.1137/090771806). URL: <https://doi.org/10.1137/090771806>.
- [TT13] A. Townsend and L. N. Trefethen. "An extension of Chebfun to two dimensions". In: *SIAM J. Sci. Comput.* 35.6 (2013), pp. C495–C518. ISSN: 1064-8275. DOI: [10.1137/130908002](https://doi.org/10.1137/130908002). URL: <https://doi.org/10.1137/130908002>.
- [Hac15] W. Hackbusch. *Hierarchical matrices: algorithms and analysis*. Vol. 49. Springer Series in Computational Mathematics. Springer, Heidelberg, 2015, pp. xxv+511. ISBN: 978-3-662-47323-8; 978-3-662-47324-5. DOI: [10.1007/978-3-662-47324-5](https://doi.org/10.1007/978-3-662-47324-5). URL: <https://doi.org/10.1007/978-3-662-47324-5>.
- [BT19] B. Beckermann and A. Townsend. "Bounds on the singular values of matrices with displacement structure". In: *SIAM Rev.* 61.2 (2019). Revised reprint of "On the singular values of matrices with displacement structure" [MR3717820], pp. 319–344. ISSN: 0036-1445. DOI: [10.1137/19M1244433](https://doi.org/10.1137/19M1244433). URL: <https://doi.org/10.1137/19M1244433>.
- [MRK20] S. Massei, L. Robol, and D. Kressner. "hm-toolbox: MATLAB software for HODLR and HSS matrices". In: *SIAM J. Sci. Comput.* 42.2 (2020), pp. C43–C68. ISSN: 1064-8275. DOI: [10.1137/19M1288048](https://doi.org/10.1137/19M1288048). URL: <https://doi.org/10.1137/19M1288048>.

Matrix equations: $AX + XB^T = C$, $AX + XA^T = C$

- [BS72] R. H. Bartels and G. W. Stewart. "Solution of the Matrix Equation $AX + XB = C$ [F4]". In: *Commun. ACM* 15.9 (Sept. 1972), pp. 820–826. ISSN:

- 0001-0782. DOI: [10.1145/361573.361582](https://doi.org/10.1145/361573.361582). URL: <https://doi.org/10.1145/361573.361582>.
- [GNV79] G. Golub, S. Nash, and C. Van Loan. “A Hessenberg-Schur method for the problem $AX + XB = C$ ”. In: *IEEE Transactions on Automatic Control* 24.6 (1979), pp. 909–913. DOI: [10.1109/TAC.1979.1102170](https://doi.org/10.1109/TAC.1979.1102170).
- [GKO95] I. Gohberg, T. Kailath, and V. Olshevsky. “Fast Gaussian elimination with partial pivoting for matrices with displacement structure”. In: *Math. Comp.* 64.212 (1995), pp. 1557–1576. ISSN: 0025-5718. DOI: [10.2307/2153371](https://doi.org/10.2307/2153371). URL: <https://doi.org/10.2307/2153371>.
- [ST97] E. B. Saff and V. Totik. *Logarithmic potentials with external fields*. Vol. 316. Grundlehren der mathematischen Wissenschaften [Fundamental Principles of Mathematical Sciences]. Appendix B by Thomas Bloom. Springer-Verlag, Berlin, 1997, pp. xvi+505. ISBN: 3-540-57078-0. DOI: [10.1007/978-3-662-03329-6](https://doi.org/10.1007/978-3-662-03329-6). URL: <https://doi.org/10.1007/978-3-662-03329-6>.
- [Sim07] V. Simoncini. “A new iterative method for solving large-scale Lyapunov matrix equations”. In: *SIAM J. Sci. Comput.* 29.3 (2007), pp. 1268–1288. ISSN: 1064-8275. DOI: [10.1137/06066120X](https://doi.org/10.1137/06066120X). URL: <https://doi.org/10.1137/06066120X>.
- [SD09] V. Simoncini and V. Druskin. “Convergence analysis of projection methods for the numerical solution of large Lyapunov equations”. In: *SIAM J. Numer. Anal.* 47.2 (2009), pp. 828–843. ISSN: 0036-1429. DOI: [10.1137/070699378](https://doi.org/10.1137/070699378). URL: <https://doi.org/10.1137/070699378>.
- [Bec11] B. Beckermann. “An error analysis for rational Galerkin projection applied to the Sylvester equation”. In: *SIAM J. Numer. Anal.* 49.6 (2011), pp. 2430–2450. ISSN: 0036-1429. DOI: [10.1137/110824590](https://doi.org/10.1137/110824590). URL: <https://doi.org/10.1137/110824590>.
- [Sim16] V. Simoncini. “Computational methods for linear matrix equations”. In: *SIAM Rev.* 58.3 (2016), pp. 377–441. ISSN: 0036-1445. DOI: [10.1137/130912839](https://doi.org/10.1137/130912839). URL: <https://doi.org/10.1137/130912839>.
- [MPR18] S. Massei, D. Palitta, and L. Robol. “Solving rank-structured Sylvester and Lyapunov equations”. In: *SIAM J. Matrix Anal. Appl.* 39.4 (2018), pp. 1564–1590. ISSN: 0895-4798. DOI: [10.1137/17M1157155](https://doi.org/10.1137/17M1157155). URL: <https://doi.org/10.1137/17M1157155>.
- [KMR19] D. Kressner, S. Massei, and L. Robol. “Low-rank updates and a divide-and-conquer method for linear matrix equations”. In: *SIAM J. Sci. Comput.* 41.2 (2019), A848–A876. ISSN: 1064-8275. DOI: [10.1137/17M1161038](https://doi.org/10.1137/17M1161038). URL: <https://doi.org/10.1137/17M1161038>.

Applications

- [Gro47] B. Gross. "On creep and relaxation". In: *J. Appl. Phys.* 18 (1947), pp. 212–221. ISSN: 0021-8979.
- [Ger48] A. N. Gerasimov. "A generalization of linear laws of deformation and its application to problems of internal friction". In: *Akad. Nauk SSSR. Prikl. Mat. Meh.* 12 (1948), pp. 251–260.
- [RLP69] Y. N. Rabotnov, F. A. Leckie, and W. Prager. *Creep problems in structural members*. Vol. 7. North-Holland Publishing Company, 1969.
- [BT86] R. L. Bagley and P. J. Torvik. "On the Fractional Calculus Model of Viscoelastic Behavior". In: *Journal of Rheology* 30.1 (1986), pp. 133–155. DOI: [10.1122/1.549887](https://doi.org/10.1122/1.549887).
- [HLQ95] T. T. Hartley, C. F. Lorenzo, and H. K. Qammer. "Chaos in a fractional order Chua's system". In: *IEEE Transactions on Circuits and Systems I: Fundamental Theory and Applications* 42.8 (1995), pp. 485–490.
- [Las02] N. Laskin. "Fractional Schrödinger equation". In: *Phys. Rev. E* 66 (5 Nov. 2002), p. 056108. DOI: [10.1103/PhysRevE.66.056108](https://doi.org/10.1103/PhysRevE.66.056108). URL: <https://link.aps.org/doi/10.1103/PhysRevE.66.056108>.
- [WL07] Y. Wang and C. Li. "Does the fractional Brusselator with efficient dimension less than 1 have a limit cycle?" In: *Physics Letters A* 363.5 (2007), pp. 414–419. ISSN: 0375-9601. DOI: <https://doi.org/10.1016/j.physleta.2006.11.038>. URL: <https://www.sciencedirect.com/science/article/pii/S0375960106018020>.
- [Mül+11] S. Müller, M. Kästner, J. Brummund, and V. Ulbricht. "A nonlinear fractional viscoelastic material model for polymers". In: *Computational Materials Science* 50.10 (2011), pp. 2938–2949. ISSN: 0927-0256. DOI: <https://doi.org/10.1016/j.commatsci.2011.05.011>.
- [BEK13] M. Benzi, E. Estrada, and C. Klymko. "Ranking hubs and authorities using matrix functions". In: *Linear Algebra Appl.* 438.5 (2013), pp. 2447–2474. ISSN: 0024-3795. DOI: [10.1016/j.laa.2012.10.022](https://doi.org/10.1016/j.laa.2012.10.022). URL: <https://doi.org/10.1016/j.laa.2012.10.022>.
- [Fen+13] C. Fenu, D. Martin, L. Reichel, and G. Rodriguez. "Block Gauss and anti-Gauss quadrature with application to networks". In: *SIAM J. Matrix Anal. Appl.* 34.4 (2013), pp. 1655–1684. ISSN: 0895-4798. DOI: [10.1137/120886261](https://doi.org/10.1137/120886261). URL: <https://doi.org/10.1137/120886261>.
- [Luc13] Y. Luchko. "Fractional wave equation and damped waves". In: *Journal of Mathematical Physics* 54.3 (2013), p. 031505. DOI: [10.1063/1.4794076](https://doi.org/10.1063/1.4794076). eprint: <https://doi.org/10.1063/1.4794076>. URL: <https://doi.org/10.1063/1.4794076>.

- [RM14] A. Riascos and J. Mateos. "Fractional dynamics on networks: Emergence of anomalous diffusion and Lévy flights". In: *Physical Review E - Statistical, Nonlinear, and Soft Matter Physics* 90.3 (2014). cited By 49. DOI: [10.1103/PhysRevE.90.032809](https://doi.org/10.1103/PhysRevE.90.032809). URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84907266357&doi=10.1103%2fPhysRevE.90.032809&partnerID=40&md5=be06b3148ba7bc17a50f52854beb9fac>.
- [BK15] M. Benzi and C. Klymko. "On the limiting behavior of parameter-dependent network centrality measures". In: *SIAM J. Matrix Anal. Appl.* 36.2 (2015), pp. 686–706. ISSN: 0895-4798. DOI: [10.1137/130950550](https://doi.org/10.1137/130950550). URL: <https://doi.org/10.1137/130950550>.
- [Cus+15] N. Cusimano, A. Bueno-Orovio, I. Turner, and K. Burrage. "On the Order of the Fractional Laplacian in Determining the Spatio-Temporal Evolution of a Space-Fractional Model of Cardiac Electrophysiology". In: *PLoS ONE* 10.12 (2015). cited By 30. DOI: [10.1371/journal.pone.0143938](https://doi.org/10.1371/journal.pone.0143938). URL: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84955438668&doi=10.1371%2fjournal.pone.0143938&partnerID=40&md5=0b18e4be5403a7316bb63f69a0eb5f80>.
- [WTG15] B. J. West, M. Turalska, and P. Grigolini. "Fractional calculus ties the microscopic and macroscopic scales of complex network dynamics". In: *New Journal of Physics* 17.4 (Apr. 2015), p. 045009. DOI: [10.1088/1367-2630/17/4/045009](https://doi.org/10.1088/1367-2630/17/4/045009). URL: <https://doi.org/10.1088/1367-2630/17/4/045009>.
- [HZ16] J. Huo and H. Zhao. "Dynamical analysis of a fractional SIR model with birth and death on heterogeneous complex networks". In: *Physica A: Statistical Mechanics and its Applications* 448 (2016), pp. 41–56. ISSN: 0378-4371. DOI: <https://doi.org/10.1016/j.physa.2015.12.078>. URL: <https://www.sciencedirect.com/science/article/pii/S0378437115011061>.
- [Arr+18] F. Arrigo, P. Grindrod, D. J. Higham, and V. Noferini. "On the exponential generating function for non-backtracking walks". In: *Linear Algebra Appl.* 556 (2018), pp. 381–399. ISSN: 0024-3795. DOI: [10.1016/j.laa.2018.07.010](https://doi.org/10.1016/j.laa.2018.07.010). URL: <https://doi.org/10.1016/j.laa.2018.07.010>.
- [Ben+20] M. Benzi, D. Bertaccini, F. Durastante, and I. Simunec. "Non-local network dynamics via fractional graph Laplacians". In: *J. Complex Netw.* 8.3 (2020), cnaa017, 29. ISSN: 2051-1310. DOI: [10.1093/comnet/cnaa017](https://doi.org/10.1093/comnet/cnaa017). URL: <https://doi.org/10.1093/comnet/cnaa017>.
- [GGV20] A. Giusti, R. Garrappa, and G. Vachon. "On the Kuzmin model in fractional Newtonian gravity". In: *The European Physical Journal Plus* 135.10 (Oct. 2020), p. 798. ISSN: 2190-5444. DOI: [10.1140/epjp/s13360-020-00831-9](https://doi.org/10.1140/epjp/s13360-020-00831-9). URL: <https://doi.org/10.1140/epjp/s13360-020-00831-9>.

- [DE22] F. Diaz-Diaz and E. Estrada. “Time and space generalized diffusion equation on graph/networks”. In: *Chaos, Solitons & Fractals* 156 (2022), p. 111791. ISSN: 0960-0779. DOI: <https://doi.org/10.1016/j.chaos.2022.111791>. URL: <https://www.sciencedirect.com/science/article/pii/S0960077922000029>.

Toolbox

- [Lio32] J. Liouville. *Mémoire sur quelques questions de géométrie et de mécanique, et sur un nouveau genre de calcul pour résoudre ces questions*. 1832.
- [Hen74] P. Henrici. *Applied and computational complex analysis*. Pure and Applied Mathematics. Volume 1: Power series—integration—conformal mapping—location of zeros. Wiley-Interscience [John Wiley & Sons], New York-London-Sydney, 1974, pp. xv+682.
- [Hen79] P. Henrici. “Fast Fourier methods in computational complex analysis”. In: *SIAM Rev.* 21.4 (1979), pp. 481–527. ISSN: 0036-1445. DOI: [10.1137/1021093](https://doi.org/10.1137/1021093). URL: <https://doi.org/10.1137/1021093>.
- [Bre80] C. Brezinski. *Padé-type approximation and general orthogonal polynomials*. Vol. 50. International Series of Numerical Mathematics. Birkhäuser Verlag, Basel-Boston, Mass., 1980, p. 250. ISBN: 3-7643-1100-2.
- [EES83] S. C. Eisenstat, H. C. Elman, and M. H. Schultz. “Variational iterative methods for nonsymmetric systems of linear equations”. In: *SIAM J. Numer. Anal.* 20.2 (1983), pp. 345–357. ISSN: 0036-1429. DOI: [10.1137/0720023](https://doi.org/10.1137/0720023). URL: <https://doi.org/10.1137/0720023>.
- [DR84] P. J. Davis and P. Rabinowitz. *Methods of numerical integration*. Second. Computer Science and Applied Mathematics. Academic Press, Inc., Orlando, FL, 1984, pp. xiv+612. ISBN: 0-12-206360-0.
- [Bra86] D. Braess. *Nonlinear approximation theory*. Vol. 7. Springer Series in Computational Mathematics. Springer-Verlag, Berlin, 1986, pp. xiv+290. ISBN: 3-540-13625-8. DOI: [10.1007/978-3-642-61609-9](https://doi.org/10.1007/978-3-642-61609-9). URL: <https://doi.org/10.1007/978-3-642-61609-9>.
- [SS86] Y. Saad and M. H. Schultz. “GMRES: a generalized minimal residual algorithm for solving nonsymmetric linear systems”. In: *SIAM J. Sci. Statist. Comput.* 7.3 (1986), pp. 856–869. ISSN: 0196-5204. DOI: [10.1137/0907058](https://doi.org/10.1137/0907058). URL: <https://doi.org/10.1137/0907058>.
- [Saa93] Y. Saad. “A flexible inner-outer preconditioned GMRES algorithm”. In: *SIAM J. Sci. Comput.* 14.2 (1993), pp. 461–469. ISSN: 1064-8275. DOI: [10.1137/0914028](https://doi.org/10.1137/0914028). URL: <https://doi.org/10.1137/0914028>.
- [IT95] M.-P. Istace and J.-P. Thiran. “On the third and fourth Zolotarev problems in the complex plane”. In: *SIAM J. Numer. Anal.* 32.1 (1995), pp. 249–259. ISSN: 0036-1429. DOI: [10.1137/0732009](https://doi.org/10.1137/0732009). URL: <https://doi.org/10.1137/0732009>.

- [GPS96] A. Greenbaum, V. Pták, and Z. Strakoš. “Any Nonincreasing Convergence Curve is Possible for GMRES”. In: *SIAM J. Matrix Anal. Appl.* 17.3 (1996), pp. 465–469. DOI: [10.1137/S0895479894275030](https://doi.org/10.1137/S0895479894275030). eprint: <http://dx.doi.org/10.1137/S0895479894275030>. URL: <http://dx.doi.org/10.1137/S0895479894275030>.
- [Bha97] R. Bhatia. *Matrix analysis*. Vol. 169. Graduate Texts in Mathematics. Springer-Verlag, New York, 1997, pp. xii+347. ISBN: 0-387-94846-5. DOI: [10.1007/978-1-4612-0653-8](https://doi.org/10.1007/978-1-4612-0653-8). URL: <https://doi.org/10.1007/978-1-4612-0653-8>.
- [BT98] L. Brugnano and D. Trigiante. *Solving differential problems by multistep initial and boundary value methods*. Vol. 6. Stability and Control: Theory, Methods and Applications. Gordon and Breach Science Publishers, Amsterdam, 1998, pp. xvi+418. ISBN: 90-5699-107-8.
- [EE01] M. Eiermann and O. G. Ernst. “Geometric aspects of the theory of Krylov subspace methods”. In: *Acta Numer.* 10 (2001), pp. 251–312. ISSN: 0962-4929. DOI: [10.1017/S0962492901000046](https://doi.org/10.1017/S0962492901000046). URL: <https://doi.org/10.1017/S0962492901000046>.
- [Joh02] W. P. Johnson. “The curious history of Faà di Bruno’s formula”. In: *Amer. Math. Monthly* 109.3 (2002), pp. 217–234. ISSN: 0002-9890. DOI: [10.2307/2695352](https://doi.org/10.2307/2695352). URL: <https://doi.org/10.2307/2695352>.
- [DH03] P. I. Davies and N. J. Higham. “A Schur-Parlett algorithm for computing matrix functions”. In: *SIAM J. Matrix Anal. Appl.* 25.2 (2003), pp. 464–485. ISSN: 0895-4798. DOI: [10.1137/S0895479802410815](https://doi.org/10.1137/S0895479802410815). URL: <https://doi.org/10.1137/S0895479802410815>.
- [Sta03] H. R. Stahl. “Best uniform rational approximation of x^α on $[0, 1]$ ”. In: *Acta Math.* 190.2 (2003), pp. 241–306. ISSN: 0001-5962. DOI: [10.1007/BF02392691](https://doi.org/10.1007/BF02392691). URL: <https://doi.org/10.1007/BF02392691>.
- [PS08] M. Popolizio and V. Simoncini. “Acceleration techniques for approximating the matrix exponential operator”. In: *SIAM J. Matrix Anal. Appl.* 30.2 (2008), pp. 657–683. ISSN: 0895-4798. DOI: [10.1137/060672856](https://doi.org/10.1137/060672856). URL: <https://doi.org/10.1137/060672856>.
- [KB09] T. G. Kolda and B. W. Bader. “Tensor decompositions and applications”. In: *SIAM Rev.* 51.3 (2009), pp. 455–500. ISSN: 0036-1445. DOI: [10.1137/07070111X](https://doi.org/10.1137/07070111X). URL: <https://doi.org/10.1137/07070111X>.
- [Ose11] I. V. Oseledets. “Tensor-train decomposition”. In: *SIAM J. Sci. Comput.* 33.5 (2011), pp. 2295–2317. ISSN: 1064-8275. DOI: [10.1137/090752286](https://doi.org/10.1137/090752286). URL: <https://doi.org/10.1137/090752286>.
- [Dol13] S. V. Dolgov. “TT-GMRES: solution to a linear system in the structured tensor format”. In: *Russian J. Numer. Anal. Math. Modelling* 28.2 (2013), pp. 149–172. ISSN: 0927-6467. DOI: [10.1515/rnam-2013-0009](https://doi.org/10.1515/rnam-2013-0009). URL: <https://doi.org/10.1515/rnam-2013-0009>.

- [KKT13] V. A. Kazeev, B. N. Khoromskij, and E. E. Tyrtyshnikov. “Multilevel Toeplitz matrices generated by tensor-structured vectors and convolution with logarithmic complexity”. In: *SIAM J. Sci. Comput.* 35.3 (2013), A1511–A1536. ISSN: 1064-8275. DOI: [10.1137/110844830](https://doi.org/10.1137/110844830). URL: <https://doi.org/10.1137/110844830>.
- [DS14] S. V. Dolgov and D. V. Savostyanov. “Alternating minimal energy methods for linear systems in higher dimensions”. In: *SIAM J. Sci. Comput.* 36.5 (2014), A2248–A2271. ISSN: 1064-8275. DOI: [10.1137/140953289](https://doi.org/10.1137/140953289). URL: <https://doi.org/10.1137/140953289>.
- [FGS14] A. Frommer, S. Güttel, and M. Schweitzer. “Efficient and stable Arnoldi restarts for matrix functions based on quadrature”. In: *SIAM J. Matrix Anal. Appl.* 35.2 (2014), pp. 661–683. ISSN: 0895-4798. DOI: [10.1137/13093491X](https://doi.org/10.1137/13093491X). URL: <https://doi.org/10.1137/13093491X>.
- [MP14] I. Moret and M. Popolizio. “The restarted shift-and-invert Krylov method for matrix functions”. In: *Numer. Linear Algebra Appl.* 21.1 (2014), pp. 68–80. ISSN: 1070-5325. DOI: [10.1002/nla.1862](https://doi.org/10.1002/nla.1862). URL: <https://doi.org/10.1002/nla.1862>.
- [BG17] M. Berljafa and S. Güttel. “The RKFIT algorithm for nonlinear rational approximation”. In: *SIAM J. Sci. Comput.* 39.5 (2017), A2049–A2071. ISSN: 1064-8275. DOI: [10.1137/15M1025426](https://doi.org/10.1137/15M1025426). URL: <https://doi.org/10.1137/15M1025426>.
- [NST18] Y. Nakatsukasa, O. Sète, and L. N. Trefethen. “The AAA algorithm for rational approximation”. In: *SIAM J. Sci. Comput.* 40.3 (2018), A1494–A1522. ISSN: 1064-8275. DOI: [10.1137/16M1106122](https://doi.org/10.1137/16M1106122). URL: <https://doi.org/10.1137/16M1106122>.
- [Ben21] M. Benzi. “Some uses of the field of values in numerical analysis”. In: *Boll. Unione Mat. Ital.* 14.1 (2021), pp. 159–177. ISSN: 1972-6724. DOI: [10.1007/s40574-020-00249-2](https://doi.org/10.1007/s40574-020-00249-2). URL: <https://doi.org/10.1007/s40574-020-00249-2>.
- [Bur+21] B. Burnett, S. Gottlieb, Z. J. Grant, and A. Heryudono. “Performance Evaluation of Mixed-Precision Runge-Kutta Methods”. In: *2021 IEEE High Performance Extreme Computing Conference (HPEC)*. IEEE. 2021, pp. 1–6.
- [Hof21] C. Hofreither. “An algorithm for best rational approximation based on barycentric rational interpolation”. In: *Numer. Algorithms* 88.1 (2021), pp. 365–388. ISSN: 1017-1398. DOI: [10.1007/s11075-020-01042-0](https://doi.org/10.1007/s11075-020-01042-0). URL: <https://doi.org/10.1007/s11075-020-01042-0>.
- [DMR09] F. Diele, I. Moret, and S. Ragni. “Error estimates for polynomial Krylov approximations to matrix functions”. In: *SIAM J. Matrix Anal. Appl.* 30.4 (2008/09), pp. 1546–1565. ISSN: 0895-4798. DOI: [10.1137/070688924](https://doi.org/10.1137/070688924). URL: <https://doi.org/10.1137/070688924>.