

References

- [1] Z.A. Anastassi and A.A. Košti. A 6(4) optimized embedded runge–kutta–nyström pair for the numerical solution of periodic problems. *Journal of Computational and Applied Mathematics*, 275:311 – 320, 2015.
- [2] H. Beušt. Symplectic integration of hierarchical stellar systems. *Astronomy & Astrophysics*, 400:1129–1144, March 2003.
- [3] S. Blanes, F. Casas, A. Farrés, J. Laskar, J. Makazaga, and A. Murua. New families of symplectic splitting methods for numerical integration in dynamical astronomy. *Applied Numerical Mathematics*, 68:58 – 72, 2013.
- [4] S. Blanes, F. Casas, and J. Ros. Symplectic integration with processing: A general study. *SIAM Journal on Scientific Computing*, 21(2):711–727, 1999.
- [5] S. Blanes, F. Casas, and J. Ros. Processing symplectic methods for near-integrable hamiltonian systems. *Celestial Mechanics and Dynamical Astronomy*, 77(1):17–36, 2000.
- [6] S. Blanes, F. Casas, and J. Ros. High-order runge–kutta–nyström geometric methods with processing. *Applied Numerical Mathematics*, 39(3–4):245 – 259, 2001. Themes in Geometric Integration.
- [7] S. Blanes, F. Casas, and J. Ros. New families of symplectic runge–kutta–nyström integration methods. In Lubin Vulkov, Plamen Yalamov, and Jerzy Waśniewski, editors, *Numerical Analysis and Its Applications*, volume 1988 of *Lecture Notes in Computer Science*, pages 102–109. Springer Berlin Heidelberg, 2001.
- [8] S. Blanes and P. C. Moan. Practical symplectic partitioned runge–kutta and runge–kutta–nyström methods. *J. Comput. Appl. Math.*, 142(2):313–330, May 2002.
- [9] Sergio Blanes, Fernando Casas, and Ander Murua. Splitting methods for non-autonomous linear systems. *International Journal of Computer Mathematics*, 84(6):713–727, 2007.
- [10] Ben K. Bradley, Brandon A. Jones, Gregory Beylkin, Kristian Sandberg, and Penina Axelrad. Bandlimited implicit runge–kutta integration for astrodynamics. *Celestial Mechanics and Dynamical Astronomy*, 119(2):143–168, 2014.
- [11] M. Calvo, S. González-Pinto, and J.I. Montijano. Global error estimation based on the tolerance proportionality for some adaptive runge–kutta codes. *Journal of Computational and Applied Mathematics*, 218(2):329 – 341, 2008. The Proceedings of the Twelfth International Congress on Computational and Applied MathematicsThe Proceedings of the Twelfth International Congress on Computational and Applied Mathematics.
- [12] M. CALVO, D. J. HIGHAM, J. I. MONTIJANO, and L. RÁNDAZ. Global error estimation with adaptive explicit runge–kutta methods. *IMA Journal of Numerical Analysis*, 16(1):47–63, 1996.
- [13] M. P. Calvo and J. M. Sanz-Serna. The development of variable-step symplectic integrators with application to the two-body problem. *SIAM J. Sci. Comput.*, 14(4):936–952, July 1993.
- [14] M. P. Calvo and J. M. Sanz-Serna. High-order symplectic runge–kutta–nyström methods. *SIAM Journal on Scientific Computing*, 14(5):1237–1252, 1993.
- [15] S. A. Chin and D. W. Kidwell. Higher-order force gradient symplectic algorithms. *preprint*, 62:8746, December 2000.
- [16] Siu A. Chin. Symplectic integrators from composite operator factorizations. *Physics Letters A*, 226(6):344 – 348, 1997.

- [17] Fasma Diele and Carmela Marangi. Explicit symplectic partitioned runge-kutta-nyström methods for non-autonomous dynamics. *Applied Numerical Mathematics*, 61(7):832 – 843, 2011.
- [18] J. R. DORMAND, M. E. A. EL-MIKKAWY, and P. J. PRINCE. Families of runge-kutta-nyström formulae. *IMA Journal of Numerical Analysis*, 7(2):235–250, 1987.
- [19] J. R. DORMAND, M. E. A. EL-MIKKAWY, and P. J. PRINCE. High-order embedded runge-kutta-nyström formulae. *IMA Journal of Numerical Analysis*, 7(4):423–430, 1987.
- [20] Moawwad El-Mikkawy and El-Desouky Rahmo. A new optimized non-fsal embedded runge-kutta-nyström algorithm of orders 6 and 4 in six stages. *Applied Mathematics and Computation*, 145(1):33 – 43, 2003.
- [21] Vacheslav Vasilievitch Emel’yanenko. A method of symplectic integrations with adaptive time-steps for individual hamiltonians in the planetary n-body problem. *Celestial Mechanics and Dynamical Astronomy*, 98(3):191–202, 2007.
- [22] Edgar Everhart. An efficient integrator that uses gauss-radau spacings. In Andrea Carusi and GiovanniB. Valsecchi, editors, *Dynamics of Comets: Their Origin and Evolution*, volume 115 of *Astrophysics and Space Science Library*, pages 185–202. Springer Netherlands, 1985.
- [23] Ariadna Farrés, Jacques Laskar, Sergio Blanes, Fernando Casas, Joseba Makazaga, and Ander Murua. High precision symplectic integrators for the solar system. *Celestial Mechanics and Dynamical Astronomy*, 116(2):141–174, 2013.
- [24] A. Fienga, H. Manche, J. Laskar, and M. Gastineau. Inpopo6: a new numerical planetary ephemeris. *Astronomy & Astrophysics*, 477(1):315–327, 2008.
- [25] J.M. Fine. Low order practical runge-kutta-nyström methods. *Computing*, 38(4):281–297, 1987.
- [26] William M. Folkner, James G. Williams, Dale H. Boggs, Ryan S. Park, and Petr Kuchynka. The planetary and lunar ephemerides de430 and de431. *Interplanetary Network Progress Report*, 42(196), 2014.
- [27] E. Hairer, R. I. McLachlan, and A. Razakarivony. Achieving brouwer’s law with implicit runge-kutta methods. *BIT Numerical Mathematics*, 48(2):231–243, 2008.
- [28] Ernst Hairer, Robert I. McLachlan, and Robert D. Skeel. On energy conservation of the simplified takahashi-imada method. *Mathematical Modelling and Numerical Analysis*, 43(4):631–644, 2009. ID: unige:5211.
- [29] Ernst Hairer and Gušlaf Söderlind. Explicit, time reversible, adaptive step size control. *SIAM Journal on Scientific Computing*, 26(6):1838–1851, 2005.
- [30] Brandon Jones. Orbit propagation using gauss-legendre collocation. In *AIAA/AAS Astrodynamics Specialist Conference*, Guidance, Navigation, and Control and Co-located Conferences, 2012.
- [31] Brandon A. Jones and Rodney L. Anderson. A survey of symplectic and collocation integration methods for orbit propagation. In *AAS/AIAA Spaceflight Mechanics Meeting*, volume 143 of *Advances in the Astronautical Sciences*, 2012.
- [32] V. Lainey, L. Duriez, and A. Vienne. New accurate ephemerides for the galilean satellites of jupiter. *Astronomy & Astrophysics*, 420(3):1171–1183, 2004.
- [33] A. C. Long, Jr. J. O. Cappellari, C. E. Velez, and A. J. Fuchs. Goddard trajectory determination system (gtlds) mathematical theory revision 1. Technical Report FDD/552-89/001 CSC/TR-89/6001, Computer Sciences Corporation and National Aeronautics and Space Administration/Goddard Space Flight Center, July 1989.

- [34] Robert McLachlan. Symplectic integration of hamiltonian wave equations. *Numerische Mathematik*, 66(1):465–492, 1993.
- [35] Robert I. McLachlan. On the numerical integration of ordinary differential equations by symmetric composition methods. *SIAM J. Sci. Comput.*, 16(1):151–168, January 1995.
- [36] Robert I. McLachlan. A new implementation of symplectic runge–kutta methods. *SIAM Journal on Scientific Computing*, 29(4):1637–1649, 2007.
- [37] Robert I. McLachlan and Pau Atela. The accuracy of symplectic integrators. *Nonlinearity*, 5:541–562, 1992.
- [38] Robert I. McLachlan and G. Reinout W. Quispel. Splitting methods. *Acta Numerica*, 11:341–434, 1 2002.
- [39] Robert I. McLachlan, G Reinout, and W Quispel. Geometric integrators for ODEs. *J. Phys. A*, 39:5251–5285, 2006.
- [40] Robert I. McLachlan. Families of high-order composition methods. *Numerical Algorithms*, 31(1-4):233–246, 2002.
- [41] O. Montenbruck. Numerical integration methods for orbital motion. *Celestial Mechanics and Dynamical Astronomy*, 53(1):59–69, 1992.
- [42] Daniel I. Okunbor and Robert D. Skeel. Canonical runge–kutta–nyström methods of orders five and six. *Journal of Computational and Applied Mathematics*, 51(3):375 – 382, 1994.
- [43] Etienne Pellegrini and Ryan P. Russell. F and g taylor series solutions to the circular restricted three body problem. In *AAS/AIAA Spaceflight Mechanics Meeting*, volume 152 of *Advances in the Astronautical Sciences*, 2014.
- [44] James R. Scott and Michael C. Martini. High-speed solution of spacecraft trajectory problems using taylor series integration. *Journal of Spacecraft and Rockets*, 47(1):199–202, 2010.
- [45] Philip W. Sharp, Mohammad A. Qureshi, and Kevin R. Grazier. High order explicit runge–kutta nyström pairs. *Numerical Algorithms*, 62(1):133–148, 2013.
- [46] B.P. Sommeijer. Explicit, high-order runge–kutta–nyström methods for parallel computers. *Applied Numerical Mathematics*, 13(1-3):221 – 240, 1993.
- [47] E. M. Standish. Jpl planetary and lunar ephemerides, de405/le405. Interoffice Memorandum IOM 312.F–98–048, Jet Propulsion Laboratory, August 1998.
- [48] M. Suzuki. Fractal decomposition of exponential operators with applications to many-body theories and Monte Carlo simulations. *Physics Letters A*, 146:319–323, June 1990.