

PUBLICATION LIST

1 Computation of Mathematical Functions

1. **A new asymptotic representation and inversion method for the Student's t distribution.** A. Gil, J. Segura, N.M. Temme. Submitted.
2. **Sharp error bounds for turning point expansions.** T.M. Dunster, A. Gil, J. Segura. Submitted.
3. **Fast and reliable high accuracy computation of Gauss-Jacobi quadrature.** A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms*. To appear.
4. **Simplified error bounds for turning point expansions.** T.M. Dunster, A. Gil, J. Segura. *Analysis and Applications*. To appear.
5. **Asymptotic expansions of Jacobi polynomials and of the nodes and weights of Gauss-Jacobi quadrature for large degree and parameters in terms of elementary functions.** A. Gil, J. Segura, N.M. Temme. *Journal of Mathematical Analysis and Applications* 494(2) (2021) 124642.
6. **Asymptotic computation of classical orthogonal polynomials.** A. Gil, J. Segura, N. M. Temme. In *Orthogonal Polynomials: Current Trends and Applications*, Eds. F. Marcellán, E.J. Huertas, v22 Springer SEMA/SEMAI. (2020). ISBN 978-3-030-56190-1
7. **Asymptotic inversion of the binomial and negative binomial cumulative distribution functions.** A. Gil, J. Segura, N.M. Temme. *Electronic Transactions on Numerical Analysis* 52 (2020) 270-280.
8. **Numerical evaluation of Airy-type integrals arising in uniform asymptotic analysis.** A. Gil, J. Segura, N.M. Temme. *Journal of Computational and Applied Mathematics* 371 (2020) 112717.

9. **Fast, reliable and unrestricted iterative computation of Gauss–Hermite and Gauss–Laguerre quadratures.** A. Gil, J. Segura, N.M. Temme. *Numerische Mathematik* 143 (2019) 649-682.
10. **On the computation and inversion of the cumulative noncentral beta distribution fction.** A. Gil, J. Segura, N.M. Temme. *Applied Mathematics and Computation* 361 (2019) 74-86.
11. **Non-iterative computation of Gauss-Jacobi quadrature.** A. Gil, J. Segura, N.M. Temme. *SIAM J Scientific Computing* 41(1) (2019) A668-A693.
12. **Uniform asymptotic expansions for Laguerre polynomials and related confluent hypergeometric functions.** T.M. Dunster, A. Gil, J. Segura. *Advances in Computational Mathematics* 44(5) (2018) 1441-1474.
13. **Asymptotic expansions of Jacobi polynomials for large values of β and of their zeros.** A. Gil, J. Segura, N.M. Temme. *SIGMA* 14 (2018), 073, 9 pages.
14. **A new Fortran 90 program to compute regular and irregular associated Legendre functions (new version announcement).** B.I. Schneider, J. Segura, A. Gil, X. Guan, K. Bartschat. *Computer Physics Communications* 225 (2018) 192-193
15. **Asymptotic approximations to the nodes and weights of Gauss-Hermite and Gauss-Laguerre quadratures.** A. Gil, J. Segura, N.M. Temme. *Studies in Applied Mathematics* 140(3) (2018) 298-332.
16. **Conical: an extended module for computing a numerically satisfactory pair of solutions of the differential equation for conical functions.** T.M. Dunster, A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 217 (2017) 193-197.
17. **Computation of asymptotic expansions of turning point problems via Cauchy’s integral formula: Bessel functions.** T.M. Dunster, A. Gil, J. Segura. *Constructive Approximation* 46(3) (2017) 645-675.

18. **Efficient algorithms for the inversion of the cumulative central beta distribution.** A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 74 (1) (2017) 77-91.
19. **Efficient computation of Laguerre Polynomials.** A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 210 (2017) 124-131.
20. **Computation of the incomplete gamma function for negative values of the argument.** A. Gil, D. Ruiz-Antolín, J. Segura, N.M. Temme. *ACM Transactions of Mathematical Software* 43 Issue 3 (2016) Article No. 26.
21. **Special functions: Computation.** Entry of the “*Encyclopedia of Applied and Computational Mathematics*”, edited by Björn Engquist. A. Gil, J. Segura, N.M. Temme. Springer. 2015.
22. **Computing the Kummer function $U(a, b, z)$ for small values of the arguments.** A. Gil, J. Segura, N.M. Temme. *Applied Mathematics and Computation* 271 (2015) 532-539.
23. **GammaCHI: a Fortran 90 package for the inversion and computation of gamma and chi-square cumulative distribution functions (central and noncentral).** A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 191(2015)132-139.
24. **Computation of a numerically satisfactory pair of solutions of the differential equation for conical functions of non-negative integer orders.** T.M. Dunster, A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 68(2015)457-509.
25. **The asymptotic and numerical inversion of the Marcum-Q function.** A. Gil, J. Segura, N.M. Temme. *Studies in Applied Mathematics* 133(2) (2014) 257-278.
26. **On the complex zeros of Airy and Bessel functions and those of their derivatives.** A. Gil, J. Segura. *Analysis and Applications* 12, 537 (2014) 537-561. Special Issue in honour of Frank Olver.

27. **Special volume on Numerical Software: Design, Analysis and Verification.** Eds. A. Gil, JM. Muller, J. Segura. *Science of Computer Programming* 90 (2014).
28. **Recent software developments for special functions in the Santander-Amsterdam project.** A. Gil, J. Segura, N.M. Temme. *Science of Computer Programming* 90(2014) 42-54.
29. **Algorithm 939: Computation of the Marcum-Q function.** A. Gil, J. Segura, N.M. Temme. *ACM Transactions on Mathematical Software* 40(3) (2014) 20 pages.
30. **Funciones Especiales en la Era Digital.** A. Gil, J. Segura, N.M. Temme. *Gaceta de la Real Sociedad Matemática Española* 17(1) (2014).
31. **On the computation of the moments of the partial chi-square distribution function.** A. Gil, J. Segura, N.M. Temme. Proceedings of the International Conference "Applications of Mathematics 2013" (2013). 98-103. ISBN 978-80-85823-61-5
32. **Efficient and accurate algorithms for the computation and inversion of the incomplete gamma function ratios.** A. Gil, J. Segura, N.M. Temme. *SIAM Journal on Scientific Computing* 34(6) (2012) A2965-A2981.
33. **Computing the zeros of Bessel functions and of the mixed derivatives $x\mathcal{C}'_\nu(x) + \gamma\mathcal{C}_\nu(x)$.** A. Gil, J. Segura. *Computers and Mathematics with Applications* 64(1) (2012) 11-21.
34. **An improved algorithm and a Fortran 90 module for computing the conical function $P_{-1/2+i\tau}^m(x)$.** A. Gil, J. Segura, N.M. Temme. *Computer Physics Communications* 183(3) (2012) 794-799.
35. **Parabolic Cylinder Function $W(a, x)$ and its derivative (algorithm).** A. Gil, J. Segura, N.M. Temme. *ACM Transactions on Mathematical Software* 38(1) (2011) Article 6.
36. **Fast and Accurate Computation of the Weber Parabolic Cylinder Function $W(a, x)$.** A. Gil, J. Segura, N.M. Temme. *IMA Journal of Numerical Analysis* 31(3) (2011) 1194-1216.

37. **A New Fortran 90 Program to Compute Regular and Irregular Associated Legendre Functions.** B.I. Schneider, J. Segura, A. Gil, X. Guan, K. Bartschat. *Computer Physics Communications* 181(12) (2010) 2091-2097.
38. **Basic Methods for Computing Special Functions.** A. Gil, J. Segura, N.M. Temme. *Recent Advances in Computational and Applied Mathematics* (2010) Ed. T.E. Simos. Springer. ISBN: 978-90-481-9980-8
39. **The Asymptotic Inversion of Certain Cumulative Distribution Functions.** A. Gil, J. Segura, N.M. Temme. *Progress in Industrial Mathematics at ECMI 2008* (2010) Springer series in Mathematics in Industry. ISBN: 978-3-642-12109-8
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41. **Numerical Methods for Special Functions.** A. Gil, J. Segura, N.M. Temme. *SIAM* (2007) 415 pp. ISBN 978-0-898716-34-4
42. **Proceedings of the Conference in Honour of Dr. Nico Temme on the Occasion of his 65th birthday.** Eds. A. Gil, J.L. López, J. Segura. *Journal of Computational and Applied Mathematics* 207 (2007).
43. **Numerically satisfactory solutions of hypergeometric recursions.** A. Gil, J. Segura, N.M. Temme. *Mathematics of Computation* 76 (2007) 1449-1468.
44. **Computation of the real zeros of the Kummer function $M(\mathbf{a};\mathbf{c};\mathbf{x})$.** A. Deaño, A. Gil, J. Segura. *Lecture Notes in Computer Science* 4151 (2006) 296-307.
45. **Computing the Real Parabolic Cylinder Functions $U(a, x)$, $V(a, x)$.** A. Gil, J. Segura, N.M. Temme. *ACM Transactions on Mathematical Software* 32(1) (2006) 70-101.

46. **Algorithm 850: Real Parabolic Cylinder Functions** $U(a, x)$, $V(a, x)$. A. Gil, J. Segura, N.M. Temme. *ACM Transactions on Mathematical Software* 32(1) (2006).
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48. **New Inequalities from Classical Sturm Theorems.** A. Deaño, A. Gil, J. Segura. *Journal of Approximation Theory* 131 (2004) 208-230.
49. **Integral representations for computing real parabolic cylinder functions.** A. Gil, J. Segura, N.M. Temme. *Numerische Mathematik* 98(1) (2004) 105-134.
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53. **Computing special functions by using quadrature rules.** A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 33 (2003) 265-275.
54. **Computing zeros and turning points of solutions of second order homogeneous linear ODEs.** A. Gil, J. Segura. *SIAM Journal on Numerical Analysis* 41(3) (2003) 827-855.
55. **On the zeros of the Scorer functions.** A. Gil, J. Segura, N.M. Temme. *Journal of Approximation Theory* 120 (2003) 253-266.
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 60. **Computing Airy functions by Numerical Quadrature.** A. Gil, J. Segura, N.M. Temme. *Numerical Algorithms* 30(1) (2002) 11-23.
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 63. **A new version of a computer program for the evaluation of toroidal harmonics.** A. Gil, J. Segura. *Computer Physics Communications* 139(2001)186
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 65. **Evaluation of Toroidal Harmonics.** J. Segura, A. Gil. *Computer Physics Communications* 124 (2000) 104-122.
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- 67. **Evaluation of Legendre functions of argument greater than one.** A. Gil, J. Segura. *Computer Physics Communications* 105 (1997) 273-283.
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- 69. **Parabolic Cylinder Functions of integer and half-integer orders for non-negative arguments.** J. Segura, A. Gil. *Computer Physics Communications* 115 (1998) 69-86.

2 Modelling and Simulation of Biological Systems

- 70. **Electrophysiological models of the human pancreatic δ -cell: from single channels to the firing of action potentials** G.J. Félix-Martínez, V. González-Vélez, J.R. Godínez-Fernández, A. Gil. *International Journal for Numerical Methods in Biomedical Engineering* 36(2) (2020) e3296.
- 71. **Modeling the influence of co-localized intracellular calcium stores on the secretory response of bovine chromaffin cells.** G.J. J. Félix-Martínez, A. Gil, J. Segura, J. Villanueva, L.M. Gutiérrez. *Computers in Medicine and Biology* 100 (2018) 165-175.
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- 73. **Understanding the role of mitochondria distribution in calcium dynamics in chromaffin cells: experiments and models.** A. Gil, V. González-Vélez, J. Villanueva and L.M. Gutiérrez. *Contributions in Mathematical and Computational Sciences* Vol. 11. Modeling Cellular Systems. Springer-Heildeberg. 2017.

74. **A theoretical study of factors influencing calcium-secretion coupling in a presynaptic active zone model.** A. Gil, V. González-Vélez, J. Segura and L.M. Gutiérrez. *Mathematical Biosciences and Engineering* 11(5) (2014) 1027-1043.
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3 Theoretical Physics: PhD publications

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98. **A theoretical approach to the $\pi \rightarrow \gamma\gamma$ reaction in nuclei.** A. Gil & E. Oset. *Physics Letters B* 346 (1995) 1-4.
99. **The axial charge renormalization in a relativistic finite nuclei description.** A. Gil, M. Kleinmann, H. Muether & E. Oset. *Nuclear Physics A* 584(1995) 621-633.
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