

## Weighted averaged Gaussian quadrature rules for modified Chebyshev measure

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The averaged and optimal averaged quadrature rules ([4, 7]) are a convenient method of approximating the error in the Gauss quadrature rule. However, to be fully applicable, they need to have internal nodes. We investigate how a weighted averaged rule for modified Chebyshev measure should be set in order to secure internality. The results are illustrated by numerical examples comparing the corresponding errors.

### References

- [1] D. Lj. Djukić, R. M. Mutavdžić Djukić, L. Reichel, M. M. Spalević, *Internality of generalized averaged Gauss quadrature rules and truncated variants for modified Chebyshev measures of the first kind*, J. Comput. App. Math., 398 (2021), Art. 113696.
- [2] W. Gautschi, *Orthogonal Polynomials: Computation and Approximation*, Oxford University Press, Oxford, 2004.
- [3] G. H. Golub, J. H. Welsch, *Calculation of Gauss quadrature rules*, Math. Comp., 23 (1969), pp. 221–230.
- [4] D. P. Laurie, *Anti-Gaussian quadrature formulas*, Math. Comp., 65 (1996), pp. 739–747.
- [5] L. Reichel, M. M. Spalević, *A new representation of generalized averaged Gauss quadrature rules*, Appl. Numer. Math., 165 (2021), pp. 614–619.
- [6] L. Reichel, M. M. Spalević, *Averaged Gauss quadrature formulas: Properties and applications*, J. Comput. Appl. Math., 410 (2022), Art. 114232.
- [7] M. M. Spalević, *On generalized averaged Gaussian formulas*, Math. Comp., 76 (2007), pp. 1483–1492.
- [8] M. M. Spalević, *On generalized averaged Gaussian formulas, II*, Math. Comp., 86 (2017), pp. 1877–1885.