

GAUSS QUADRATURE FOR LINEAR FUNCTIONALS AND LANCZOS ALGORITHM

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The Gauss quadrature can be naturally generalized to approximate quasi-definite linear functionals where the interconnections with (formal) orthogonal polynomials, (complex) Jacobi matrices and Lanczos algorithm are analogous to those in the positive definite case. In particular, the existence of the n -weight (complex) Gauss quadrature corresponds to successfully performing the first n steps of the Lanczos algorithm; see, e.g., [1, 2]. Such connections can also be extended to the case of (look-ahead) Lanczos algorithm.

References

- [1] S. Pozza, M. S. Pranić, and Z. Strakoš, *Gauss quadrature for quasi-definite linear functionals*, IMA J. Numer. Anal., 37 (2017), pp. 1468–1495.
- [2] S. Pozza, M. S. Pranić, and Z. Strakoš, *The Lanczos algorithm and complex Gauss quadrature*, Electron. Trans. Numer. Anal., 50 (2018), pp. 1–19.