

Lanczos algorithm, Gauss quadrature, and minimal partial realization

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Gauss quadrature can be naturally generalized to approximate quasi-definite linear functionals [1], where the interconnections with formal orthogonal polynomials, Padé approximants, complex Jacobi matrices and Lanczos algorithm are analogous to those in the positive definite case. The existence of the n -weight complex Gauss quadrature corresponds to performing successfully the first n steps of the non-Hermitian Lanczos algorithm. Some further results on the relation between the *non-definite* case, the look-ahead Lanczos algorithm and the minimal partial realization will be shown.

References

- [1] S. Pozza, M. Pranić, Z. Strakoš, *Gauss quadrature for quasi-definite linear functionals*, IMA Journal of Numerical Analysis, 37 (2017) 1468–1495.