

Spectral factorization of Laurent polynomials by means of quadrature formulas on the unit circle

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The spectral factorization of a Laurent polynomial $a(z)$ positive on the unit circle $|z| = 1$ consists in computing an algebraic polynomial $\gamma(z)$ such that $a(z) = \gamma(z)\gamma(z^{-1})$ and $\gamma(z^{-1})$ is Schur stable (all its roots in the open unit disk).

In this talk we deal with the computation of the spectral factor $\gamma(z)$ by means of its barycentric polynomial form. Uniformly distributed barycentric nodes on circles of radius less than one are considered. To obtain the barycentric form of $\gamma(z)$ we need to approximate certain integrals on the unit circle. We study the quadrature error. A bound of the absolute error $|\gamma(z) - \tilde{\gamma}(z)|$ of our computed approximation $\tilde{\gamma}(z)$ is obtained. Numerical examples are given.