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Weighted Chebyshev polynomials on compact subsets of the complex plane.  (English)


Summary: We study weighted Chebyshev polynomials on compact subsets of the complex plane with respect to a bounded weight function. We establish existence and uniqueness of weighted Chebyshev polynomials and derive weighted analogs of Kolmogorov’s criterion, the alternation theorem, and a characterization due to Rivlin and Shapiro. We derive invariance of the Widom factors of weighted Chebyshev polynomials under polynomial pre-images and a comparison result for the norms of Chebyshev polynomials corresponding to different weights. Finally, we obtain a lower bound for the Widom factors in terms of the Szegő integral of the weight function and discuss its sharpness.

For the entire collection see [Zbl 07372936].

MSC:

30C10  Polynomials and rational functions of one complex variable
30E10  Approximation in the complex plane
41A50  Best approximation, Chebyshev systems

Keywords:

weighted Chebyshev polynomials; Bernstein-Walsh inequality; Szegő lower bound

Full Text: DOI

References:


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