



- X Jaen Conference on Approximation Theory
- Úbeda, Jaén, Spain, June 30th - July 5th, 2019

Fejér sums and Chebyshev polynomials*

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Abstract

Let $L_w^p[-1, 1]$ be the weighted Lebesgue space on $[-1, 1]$ with $w(t) = (1 - t^2)^{-1/2}$. We prove that the rate of convergence in $L_w^p[-1, 1]$ of the Fejér sums is equivalent to a fractional modulus of smoothness of order $1/2$.

Keywords: polynomial approximation, Chebyshev polynomials, Fejér operator, direct results, strong converse results, fractional modulus of smoothness.

AMS Classification: 41A28, 41A40, 41A60.

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