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Best uniform polynomial approximation of some rational functions. (English) Zbl 1189.41004

Summary: Using the Chebyshev expansion, we explicitly determine the best uniform polynomial approximation out of $P_{qn}$ (the space of polynomials of degree at most $qn$) to a class of rational functions of the form $1/(T_q(a) \pm T_q(x))$ on $[-1, 1]$, where $T_q(x)$ is the first kind of Chebyshev polynomial of degree $q$ and $a^2 > 1$. In this way we give some new theorems about the best approximation of this class of rational functions. Furthermore we obtain the alternating set of this class of functions.

MSC:

- 41A10 Approximation by polynomials
- 41A55 Approximate quadratures

Keywords:
best polynomial approximation; alternating set; Chebyshev polynomials; uniform norm

Full Text: DOI

References:
[6] Lubinsky, D.S., Best approximation and interpolation of $1/(1+(a \cdot x)^2)$ and its transforms, J. approx. theory, 125, 106-115, (2003) · Zbl 1058.41001

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