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Rational approximation to $|x|^{\alpha}$ at the Chebyshev nodes. (Chinese. English summary)

Summary: This paper constructs a Newman-$\alpha$ type rational operator, and studies the convergence rate by utilizing it to approximate a class of non-smooth functions. It is proved that the order of approximation is $O\left(\frac{1}{n^{\alpha+\gamma} \log n}\right)$ when the modified Chebyshev nodes are selected as node group $X$, and it is verified that the result is optimal under such a construction. In essence, subdivision nodes can be further constructed and in that case, the order of approximation is $O\left(\frac{1}{n^{\alpha+\gamma} \log n}\right)$.

MSC:
41A20 Approximation by rational functions
41A25 Rate of convergence, degree of approximation

Keywords:
Chebyshev nodes; rational interpolation; Newman-$\alpha$ type rational operators; order of approximation

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