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Forcing two sums simultaneously. (In English)

Knopp, Marvin (ed.) et al., A tribute to Emil Grosswald: number theory and related analysis. Providence, RI: American Mathematical Society, Contemp. Math. 143, 321-328 (1993). [ISBN 0-8218-5155-1/pbk]

The second author and *T. J. Rivlin* [Analysis 3, 355-367 (1983; Zbl 575.41006)] sought an optimal rational interpolation process that was Féjer-stable at all sets of nodes $\mathbf{x} : (x_0, \ldots, x_n)$. They established the proposition that, if $\mathbf{x} \in (0, n]$ and $n \geq 2$, then

$$\max_{y \in (0,n]} \left\{ \left[\sum_{k=1}^{n} 1/|y - x_k| \right] \Big/ \left[\sum_{k=1}^{n} 1/(y - x_k)^2 \right] \right\} \geq (\log n)/300.$$

In this paper, the authors strengthen this result by showing that when n is large, there is a point $y \in [0, n]$ where the numerator exceeds a constant times $\log n$ and the denominator is bounded.

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Classification:
41A17 Inequalities in approximation
26D05 Inequalities for trigonometric functions and polynomials
26D15 Inequalities for sums, series and integrals of real functions

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Fejer-stable interpolation; asymptotic lower bound