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The Lebesgue constant for higher order Hermite-Fejér interpolation on the Chebyshev nodes. (English. English summary)

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Summary: “For a fixed integer $m \geq 0$, and for $n = 1, 2, 3, \dots$, let $\lambda_{2m,n}(x)$ denote the Lebesgue function associated with $(0, 1, \dots, 2m)$ Hermite-Fejér polynomial interpolation at the Chebyshev nodes $\{\cos[(2k-1)\pi/(2n)]: k = 1, 2, \dots, n\}$. We examine the Lebesgue constant $\Lambda_{2m,n} := \max\{\lambda_{2m,n}(x): -1 \leq x \leq 1\}$, and show that $\Lambda_{2m,n} = \lambda_{m,n}(1)$, thereby generalising a result of H. Ehlich and K. Zeller for Lagrange interpolation on the Chebyshev nodes. As well, the infinite term in the asymptotic expansion of $\Lambda_{2m,n}$ as $n \rightarrow \infty$ is obtained, and this result is extended to give a complete asymptotic expansion for $\Lambda_{2,n}$.”

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