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Abstracts of Short Communications and Posters

Section:

8. Analysis

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Helmberg, Gilbert, Universität Innsbruck, Austria
A corner-point Gibbs phenomenon for Fourier series in two dimensions.
Let f be the function periodic with period 2π in x and y which extends the indicator function of the parallelogram

$$A = \{(x, y) : 0 \leq \pi, y/c \leq x \leq y/c + \pi\} \qquad (0 \neq c \in \mathbb{R}).$$

The partial sums $S_{2M+1,2M=1}[f]$ of the Fourier series of f, evaluated at $\left(\frac{\pi\pi}{2M+1}, \frac{\pi y}{2M+1}\right)$, converge for $M \to \infty$ to a sum of integrals of the functions $\frac{\sin t}{t}, \frac{\sin s}{s}\frac{\sin t}{t}, \frac{\cos s}{s}\frac{\cos t}{t}$ over domains depending on x, y and c. This causes the partial sums to display near the point (0, 0) an overshoot (depending on c) of up to 37,4 % of half the jump size.