TRUDY INSTITUTA MATEMATIKI I MEKHANIKI UrO RAN

Vol. 21 No. 4 **2015**

BOUNDS FOR FOURIER WIDTHS OF CLASSES OF PERIODIC FUNCTIONS WITH A MIXED MODULUS OF SMOOTHNESS

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Received July 20, 2015

Order-exact bounds are obtained for Fourier widths of the Nikol'skii–Besov classes $\mathrm{SB}^{\Omega,l}_{p\theta}(\mathbb{T}^d)$ and Triebel–Lizorkin classes $\mathrm{SF}^{\Omega,l}_{p\theta}(\mathbb{T}^d)$ of functions with a given majorant Ω for the mixed modulus of smoothness of order l in the space $L_q(\mathbb{T}^d)$ for all relations between the parameters p, q, and θ under some conditions on Ω. The upper bounds follow from order-exact bounds for approximations of the classes $\mathrm{SB}^{\Omega,l}_{p\theta}(\mathbb{T}^d)$ and $\mathrm{SF}^{\Omega,l}_{p\theta}(\mathbb{T}^d)$ by special partial sums of Fourier series in the multiple system Ψ_d of periodized Meyer wavelets.

Keywords: Fourier width, mixed modulus of smoothness, function spaces, wavelet system.

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Cite this article as:
Sh. A. Balgimbaeva, T. I. Smirnov, Bounds for Fourier widths of classes of periodic functions with a mixed modulus of smoothness, *Tr. Inst. Mat. Mekh. UrO RAN*, 2015, vol. 21, no. 4, pp. 78–94 .