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Structural and Geometric Characteristics of Sets of Convergence and Divergence of Multiple Fourier Expansions

Abstract. We investigate problem of convergence of Fourier expansions (trigonometric Fourier series, Walsh-Fourier series, Fourier integrals) in multidimensional case, namely, we are interested in the following problem. What sort of structural and geometric characteristics should a set E, $E \subset T^N = (0,1)^N$, $N \geq 2$, possess and what sort of smoothness (minimal smoothness) should a function f have on E as well as on $CE = T^N \setminus E$ in order that Fourier expansion of f would converge almost everywhere on E.