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Bernstein and Nikol'skiĭ type inequalities for entire functions of exponential type in Hardy spaces in tubes

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Abstract

Bernstein and Nikol'skiĭ type inequalities for entire functions of exponential type which belong to Hardy spaces $H^p(T_\Gamma)$, $0 < p < \infty$, are obtained. Here T_Γ is a tube over an open cone Γ, which is a multidimensional generalization of the upper half-plane.

Keywords: Bernstein type inequality, Nikol'skiĭ type inequality, entire function of exponential type, Hardy space, tube over open cone.

MSC: Primary 41A17; Secondary 42B30, 42B35.

§1. Introduction

Univariate Bernstein type inequalities for entire functions of exponential type σ are extremely useful tools in approximation theory (see, e.g., [1, Ch. 12, § 12.11]). Usually, they have the following form

$$\|f'\| \leq \sigma \|f\|.$$

Initially formulated by S. N. Bernstein for trigonometric polynomials in uniform norms, the inequality has been obtained for many other normed and pre-normed spaces as well.