
 $F_A^A T^2 0_0 0_0$

Optimal Recovery of Analytic Functions from Hardy–Sobolev Spaces

K. Yu. Osipenko, MATI – Russian State Technology University, Russia

AMS Classification: 41A46, 30E05, 30D55

Keywords and phrases: Optimal recovery, Hardy–Sobolev spaces

Denote by $H_{\infty,\beta}^r$ the class of 2π -periodic, analytic in the strip $S_\beta := \{z \in \mathbb{C} : |\operatorname{Im} z| < \beta\}$ functions f , which satisfy the condition $|f^{(r)}(z)| \leq 1$, $z \in S_\beta$. We consider the problem of optimal recovery of $f(\xi)$, $\xi \in \mathbb{T} := [0, 2\pi)$, using the information $If = (l_1 f, \dots, l_n f)$, where $l_j f$ are the Fourier coefficients of f or function values at a fixed system of nodes from \mathbb{T} .

We calculate the intrinsic error

$$e(\xi, H_{\infty,\beta}^r, I) := \inf_{S: \mathbb{C}^n \rightarrow \mathbb{C}} \sup_{f \in H_{\infty,\beta}^r} |f(\xi) - S(If)|$$

and find an optimal algorithm of recovery S_0 for which the infimum is attained. To obtain optimal recovery algorithms we use a method based on parametrization of extremal functions in the dual extremal problem

$$\sup_{\substack{f \in H_{\infty,\beta}^r \\ If=0}} |f(\xi)|.$$