

APPROXIMATION ERROR OF GENERALIZED SHANNON SAMPLING OPERATORS WITH BANDLIMITED KERNELS IN TERMS OF AN AVERAGED MODULUS OF SMOOTHNESS

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The generalized sampling operator is given by ($t \in \mathbb{R}; w > 0$)

$$(1) \quad (S_w f)(t) := \sum_{k=-\infty}^{\infty} f\left(\frac{k}{w}\right) s(wt - k).$$

In this talk we study an even band-limited kernel s , defined as Fourier cosine transform of an even window function $\lambda \in C_{[-1,1]}$, $\lambda(0) = 1$, $\lambda(u) = 0$ ($|u| \geq 1$).

We will estimate the order of approximation of the sampling operator (1) for functions f belonging in a suitable subspace $\Lambda^p \subset L^p(\mathbb{R})$ (see also [1]) in terms of an averaged modulus of smoothness τ_{2r} (see [2]).

Theorem 1. *Let sampling operator S_w^r ($w > 0$) be defined by the kernel s with $\lambda = \lambda_r$ and for some $r \in \mathbb{N}$ let*

$$(2) \quad \lambda_r(u) := 1 - \sum_{j=r}^{\infty} c_j u^{2j}, \quad \sum_{j=r}^{\infty} |c_j| \leq \infty.$$

Then for $f \in \Lambda^p$ ($1 \leq p < \infty$)

$$(3) \quad \|S_w^r f - f\|_p \leq M_r \tau_{2r}\left(f; \frac{1}{w}\right)_p.$$

The constants M_r are independent of f and w .

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REFERENCES

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