
ON THE CONSTRUCTION AND L^p -CONVERGENCE OF NEW TYPE OF SAMPLING OPERATORS

Metin TURGAY^{1,2}, Sadettin KURŞUN³

¹*Selcuk University, Department of Mathematics, Faculty of Science, 42003, Selcuklu, Konya, Türkiye*

²*Constructive Mathematical Analysis Research Laboratory (CMARL), Selcuk University, 42003, Selcuklu, Konya, Türkiye*

³*Izmir Katip Celebi University, Department of Information Security Technology, Cigli, Izmir, 35620, Turkey*

ABSTRACT

This study proposes a novel family of sampling operators within the Durrmeyer setting, designated as Hermite-Durrmeyer type operators. Our investigation begins by proving the continuity of these operators within $L^p(\mathbb{R})$ spaces for $1 \leq p < \infty$. We then proceed to analyze the approximation behavior in the norm topology, deriving quantitative error bounds through the use of appropriate moduli of continuity. To substantiate the theoretical framework, we present specific examples of kernels that fulfill the necessary conditions, supported by numerical experiments and graphical representations. The outcomes validate the utility of this new class of operators, specifically illustrating how incorporating derivative data enhances approximation accuracy and verifies the predicted convergence speeds.

Keywords sampling operators · Hermite-Durrmeyer type operators · convergence properties

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