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ON THE GENERALIZATION OF THE CHLODOWSKY-TYPE SZÁSZ OPERATORS INCLUDING POLYNOMIALS

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ABSTRACT

In this paper, we present a new approach by using Chlodowsky-type Szász operators combining special polynomials. The first part of our research focuses on determining the convergence rate of this newly constructed operator. In particular, we analyze how quickly and accurately these operators converge to given functions. Then, several approximation results are derived that provide insight into the effectiveness of the operators on different classes of functions. In addition, we present error estimates based on the weighted modulus of continuity, supported by tabulated numerical data showing the accuracy and stability of the operators in function approximation. In the last section, a Voronovskaya-type theorem is established that characterizes the asymptotic behavior and derivative properties of the operators as the parameter goes to infinity.

Keywords Approximation theory · Chlodowsky-type Szász operators · Weighted modulus of continuity

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