Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu
ISSN 1083-0464
Vol. No. 01, 1995, 01, pp. 13–16.
Submitted: March 16, 1995. Published: June 30, 1995.

DIFFERENTIATED SHIFT-INVARIANT MULTIVARIATE INTEGRAL OPERATORS

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Abstract. In a recent paper [1] the author, together with H. Gonska, introduced some wavelet-type, very general multivariate integral operators over $\mathbb{R}^d$, $d \geq 1$, and studied their various properties such as shift-invariance, global smoothness preservation and optimality, convergence to the unit, differentiation, and preservation of continuous multivariate probability distribution functions. These operators are introduced through a convolution-like iteration of another very general multivariate operator with a general multivariate scaling type function. In this paper the author gives sufficient conditions, so that the *partial derivatives of the above described multivariate operators* possess most of the above listed nice properties of their originals. In particular, a sufficient condition is given so that a corresponding "global smoothness preservation" sharp multivariate inequality is attained. The corresponding convergence of differentiated operators to the differentiated unit operator is given with rates of convergence.

(1991) A.M.S. (MOS) Subject Classification Codes. 60, 62, 28.

Key Words and Phrases. Wavelet integral operators, Probability distribution functions.

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