REVISTA DE LA
UNIÓN MATEMATICA ARGENTINA
Volumen 44, Número 2, 2003, Páginas 57-66

L_p – SATURATION THEOREM FOR A LINEAR COMBINATION OF INTEGRAL BASKAKOV TYPE OPERATORS

T.A.K. Sinha , P.N. Agrawal and Ali J. Mohammad

ABSTRACT. In [1], Agrawal and Thamer introduced a sequence of linear positive operators named as integral Baskakov type operators and studied some direct results in L_p – approximation by a linear combination of this sequence. In [2] they established an inverse theorem in L_p – norm for the same operators. The present paper is a continuation of their work in [1] and [2]. Here we aim to discuss a saturation theorem in L_p – norm for the above combination of integral Baskakov type operators.

1. INTRODUCTION

For $f \in L_p[0,\infty)$, $1 \le p < \infty$, Agrawal and Thamer [1] introduced a new sequence of linear positive operators in the following way:

$$(1.1) \qquad L_n(f(t);x) = \int_0^\infty K_n(t,x)\, f(t)\, dt,$$

where $K_n(t,x) = (n-1)\sum_{\nu=1}^{\infty} p_{n,\nu}(x)\, p_{n,\nu-1}(t) + (1+x)^{-n}\delta(t)$, $\delta(t)$ being the Dirac-delta function and

$$p_{n,\nu}(x) = \binom{n+\nu-1}{\nu} x^{\nu}(1+x)^{-n-\nu},\ x \in [0,\infty).$$

May [3] and Rathore [4] have described a method for forming linear combinations of a sequence of linear positive operators so as to improve the order of approximation. Following their method, in [1] Agrawal and Thamer established some direct theorems for a linear combination of the operators (1.1). Later, they [2] also obtained an inverse theorem for these operators. The approximation process is described as follows:

KEYWORDS: Linear positive operators, Saturation theorem in L_p – space, Linear combination, Steklov mean.