International Journal of
Mathematics And its Applications
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ISSN: 2347-1557

International Journal of Mathematics And its Applications
Volume 5, Issue 3-B (2017), 105–112.
ISSN: 2347-1557
Available Online: http://ijmaa.in/

International Journal of Mathematics And its Applications

Norms of the Composite Convolution Volterra Operators

Research Article

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Abstract: In this paper an endeavor has been made to compute the norms of Composite Convolution Volterra operators. An attempt has also been made to obtain the norms of powers of composite convolution operators in general and in specific cases.

MSC: Primary 47B38; Secondary 47B99.

Keywords: Composition operator, Composite Convolution Volterra operator, Radon- Nikodym derivative, Expectation operator, Hankel operator.

1. Introduction

Let (X, Ω, μ) be a $\sigma-$finite measure space. For each $f \in L^p(\mu), 1 \leq p < \infty$, there exists a unique $\phi^{-1}(\Omega)$ measurable function $E(f)$ such that $\int gfd\mu = \int gE(f)d\mu$ for every $\phi^{-1}(\Omega)$ measurable function g for which left integral exists. The function $E(f)$ is called conditional expectation of f with respect to the sub- algebra $\phi^{-1}(\Omega)$. For more details about expectation operator, one can refer to Parthasarthy [11]. Let $\phi : X \to X$ be a non-singular measurable transformation (i.e., $\mu(E) = 0 \Rightarrow \mu\phi^{-1}(E) = 0$). Then a composition transformation , for $1 \leq p < \infty, C_\phi : L^p(\mu) \to L^p(\mu)$ is defined by $C_\phi f = f o \phi$ for every $f \in L^p(\mu)$. In case C_ϕ is continuous, we call it a composition operator induced by ϕ. It is easy to see