Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Vol. No. 02, 1997, pp. 29–42.
Submitted: August 25, 1997. Published: December 30, 1997.

EIGENVALUE DISTRIBUTION OF INTEGRAL OPERATORS DEFINED BY BESOV–ORLICZ KERNELS

E. Elshobaky and M. Faragallah

Abstract. The real interpolation method has been generalized to the interpolation method with function parameter $(X_0, X_1)_{\rho,p}$ instead of $(X_0, X_1)_{\theta,p}$, replacing t^θ by some concave function ρ, see Gustavsson-Peetre [GP] and Fernandez-Garcia [FG]. The new method is particularly well-suited to interpolation of Besov-Orlicz spaces $B^s_{\Phi,q}$. The main aim of this paper is to combine the new interpolation method with König's eigenvalue theorem of integral operators defined by kernels in Besov and Sobolev spaces to find the optimal results for the asymptotic distribution of the eigenvalues of integral operators defined by kernel in Besov-Orlicz and Sobolev-Orlicz spaces. We derive some lemmas and theorems using the new interpolation method (e.g., the interpolation of L_p-spaces, Schatten classes and Besov spaces). Finally, we give a good estimate for the eigenvalues of integral operators defined by kernels belonging to vector-valued Besov-Orlicz spaces $B^s_{\Phi,q}(B^\sigma_{\Psi,v})$. We show that the eigenvalues of the integral operators defined by kernels $k \in B^s_{\Phi,q}(B^\sigma_{\Psi,v})$ belong to some Lorentz-Orlicz space $l_{\Phi,q}$. Moreover, we derive some special cases, e.g., $k \in W^s_\Phi(W^\sigma_\Psi)$ and $k \in B^s_{\Phi,q}(L_\Psi)$.

1991 A.M.S. (MOS) Subject Classification Codes. 46B20, 47B10

Key Words and Phrases. Interpolation, Eigenvalue distribution, integral operators.

Department of Mathematics, Faculty of Science
Ain Shams University, Cairo 11566, Egypt
e-mail: nagwamsa@frcu.eun.eg