

On compact power operators whose norms are eigenvalues

Julia Owino

Abstract

The class of compact operators is fundamental in operator theory. Characterization of compact operators acting on different spaces has been fascinating to many Mathematicians. Many properties such as boundedness, completeness, compactness on finite-dimensional Banach spaces are consequences of the Heine-Borel theorem which implies that the closed unit ball in a finite-dimensional Banach space is compact. Lin established that the norm of a linear compact operator is an eigenvalue for the operator if it satisfies the Daugavet equation. So the question whether every linear compact operator can be approximated by linear compact operator whose norms are eigenvalues needs to be investigated. In this paper we consider linear – fold compact power operators on Banach spaces, investigate their norms relative to eigenvalues and give various characterization of such operators. We investigate whether such operators satisfy the Daugavet equation and also whether they have a norm attaining vector. The study is based on the facts that a linear compact operator on a Banach space satisfies the Daugavet property if and only if its norm is an eigenvalue and that every compact operator on a Hilbert space has a norm attaining vector.