

n-power-class $D(D)$ Operators

Wanjala Victor, Beatrice Obiero Adhiambo, Edward Njuguna and John Wanyonyi Matuya

**1. Department of mathematics and physical sciences, Maasai
Mara University,
P.O Box 861-20500, Narok, Kenya
Tel: 020 131400**

Email: wanjalavictor421@gmail.com

**2. Department of mathematics and computing, Rongo University
P.O. Box 103-40404, Rongo, Kenya**

Abstract

Study of Drazin inverse in operators provides a way of characterizing properties of operators in various function spaces, this can be used to study null space, range and spectral properties of operators. One such class of operator is the class of $D(D)$ operators that was recently introduced. If $S \in B(H)$, then S^D is said to be the Drazin Inverse of S . In this paper, we generalize the class $D(D)$ to the class of n -power- $D(D)$. An operator $S \in B(H)$ is said to be n -power- $D(D)$ if there exists a unitary operator $U \in B(H)$ such that $S^{*n}S^D U = U S^{*n}S^D$. We study interesting algebraic properties of this class. The methodology used involved use of properties of adjoint and unitary operators. Results showed that the class of n -power- $D(D)$ is a closed subspace of $B(H)$. The study of n -power- $D(D)$ enhances the development of singular valued decomposition that is used in image processing by digital computers. We recommend more study to be done on the spectral picture of this class of operators.

Key words: n -power-class, $D(D)$ Operators, Drazin inverse