ON N-POWER HYPONORMAL OPERATORS IN MINKOWSKI SPACE

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Abstract. In this paper, we extend the concept of n-power hyponormal operators in Minkowski space, which is weaker than the case of normal operators. Furthermore, we give some basic properties of these operators.

1. Introduction

Minkowski space was initially developed by German mathematician Hermann Minkowski as a four dimensional space, with fourth dimension as time, for Maxwell's equations of electromagnetism. The mathematical structure of Minkowski spacetime was shown to be an immediate consequence of the postulates of special relativity. Minkowski space mathematically forms an indefinite inner product space with a particular type of metric matrix, known as Minkowski metric matrix. Minkowski space is considered to be the geometrically most suitable space for the study of Einstein's Theory of Special Relativity. The concept of hyponormal operators were introduced by Stampfli [8] in 1962. In 1990, Aluthge [1] extended the concept of p-hyponormal operators. Alzuraigi et al. [2] studied the n-normal operators in 2010. Guesba et al. [4] developed the concept of n-power-hyponormal operators in 2016. Here $B(H)$ denotes the set of all bounded linear operator in Minkowski space $\mathcal{M}$.

2. Preliminaries

Definition 2.1. An operator N is called n-EP in $\mathcal{M}$, if $N^n N^\oplus = N^\oplus N^n$

Definition 2.2. An operator N is called normal in $\mathcal{M}$, if $NN^\sim = N^\sim N$

Definition 2.3. An operator N is called skew-EP in $\mathcal{M}$, if $N^2 = -N^{\oplus 2}$

Definition 2.4. An operator N is called projection in $\mathcal{M}$, if $N^2 = N = N^\sim$.