On n, m+k-(α,β)- A-class (Q) Operators in Semi-Hilbertian space

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Abstract

In this paper, we generalize the class of (α,β)-class (Q) operators to the class of n,m+k-(α,β)-class (Q) Operators in Semi-Hilbertian space, we study properties of this class and relation with other classes of operators. An operator $\triangle \in B_A(H)$ is said to be n,m+k-(α,β)-A- class (Q) Operator if $\alpha^2(\triangle^{\sharp A})^{2n}\triangle^{2(m+k)} \leq_A ((\triangle^{\sharp A})^n(\triangle)^{m+k})^2 \leq_A \beta^2(\triangle^{\sharp A})^{2n}\triangle^{2(m+k)}$ where $0 \leq \alpha \leq \beta \leq 1$ and n,m and k comes from the set of reals . The methodology used involved the use of properties of unitary and adjoint operators. Results showed that this class enjoys commutativity of operators; that is if two bounded operators S and T are n,m+k-(α,β)-A- class (Q) , then ST is n,m+k-(α,β)-A- class (Q) provided S and T are commuting .The class of n,m+k-(α,β)-A-class (Q) Operator provides an important tool in the development of quantum technologies. Quantum technology provides the potential of revolutionizing sensing, computing, communication and imaging. We recommend more study to be done on this class to establish its relation with various deformed operators on the semi Hilbertian space.

Keywords: Class (Q) operator, (α,β)-class (Q) operator , Semi-Hilbert space