

Some Results on the Generalized Higher Rank Numerical Ranges

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Abstract : In this paper, the notion of rank-k numerical range of rectangular complex matrix polynomials are introduced. Some algebraic and geometrical properties are investigated. Moreover, for $\varepsilon > 0$ the notion of Birkhoff-James approximate orthogonality sets for ε -higher rank numerical ranges of rectangular matrix polynomials is also introduced and studied. The proposed definitions yield a natural generalization of the standard higher rank numerical ranges.

Keywords : Rank-k numerical range, isometry, numerical range, rectangular matrix polynomials

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