

Numerical ranges of quaternion matrices

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In the talk, results concerning numerical ranges and joint numerical ranges of matrices are reviewed. The matrices are assumed to have entries in the skew field of real quaternions. Convexity (or non-convexity) properties, as well as connections between geometric properties of numerical ranges and joint numerical ranges and algebraic properties of the matrix involved, are explored. Together with the classical concepts of numerical ranges, we consider also (joint) numerical ranges with respect to general antiautomorphisms of real quaternions. Open problems will be formulated.