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ITERATIVE METHODS AND NUMERICAL RANGE OF MATRICES.

The numerical range of $A \in M_n(\mathbb{C})$ is denoted by $W(A)$ as follows: $W(A) = \{x^*Ax : x \in \mathbb{C}^n, \|x\| = 1\}$. This notion has applications to many different branches of pure and applied science and has a long and distinguished history. In this lecture we study the role of the numerical range and polynomial numerical hulls of matrices to stagnation and convergence rate of iterative (GMRES and DGMRES) methods. (Received March 01, 2017)