

An envelope for the spectrum of a matrix

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We introduce and study an envelope-type region $\mathcal{E}(A)$ in the complex plane that contains the eigenvalues of a given $n \times n$ complex matrix A . $\mathcal{E}(A)$ is the intersection of an infinite number of regions defined by cubic curves. The notion and method of construction of $\mathcal{E}(A)$ extend the notion of the numerical range of A , $F(A)$, which is known to be an intersection of an infinite number of half-planes; as a consequence, $\mathcal{E}(A)$ is contained in $F(A)$ and represents an improvement in localizing the spectrum of A .