

SUPER-IDENTICAL PSEUDOSPECTRA

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ABSTRACT. Complex $N \times N$ matrices A, B are said to have *super-identical pseudospectra* if, for each $z \in \mathbb{C}$, the singular values of $A - zI$ are the same as those of $B - zI$. We explore this condition and its consequences. On the positive side, drawing on ideas from invariant theory, we prove that there exists an integer $m = m(N)$ such that ‘almost every’ m -tuple of $N \times N$ matrices with super-identical pseudospectra contains a pair that are unitarily equivalent. On the negative side, we present an example of a pair of non-derogatory 4×4 matrices A, B with super-identical pseudospectra such that $\|A^2\| \neq \|B^2\|$.

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