The Possible Shapes of Numerical Ranges

J. William Helton

I. M. Spitkovsky
William & Mary, imspitkovsky@gmail.com

Follow this and additional works at: https://scholarworks.wm.edu/aspubs

Recommended Citation

This Article is brought to you for free and open access by the Arts and Sciences at W&M ScholarWorks. It has been accepted for inclusion in Arts & Sciences Articles by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.
THE POSSIBLE SHAPES OF NUMERICAL RANGES

J. WILLIAM HELTON AND I. M. SPITKOVSKY

Abstract. Which convex subsets of $\mathbb{C}$ are the numerical range $W(A)$ of some matrix $A$? This paper gives a precise characterization of these sets. In addition to this we show that for any $A$ there exists a symmetric $B$ of the same size such that $W(A) = W(B)$ thereby settling an open question from [2].


Keywords and phrases: Numerical range, linear matrix inequalities.

REFERENCES