

A METHOD FOR THE INVERSE NUMERICAL RANGE PROBLEM*

CHRISTOS CHORIANOPOULOS[†], PANAYIOTIS PSARRAKOS[†], AND FRANK UHLIG[‡]

Abstract. For a given complex square matrix A , we develop, implement and test a fast geometric algorithm to find a unit vector that generates a given point in the complex plane if this point lies inside the numerical range of A , and if not, the method determines that the given point lies outside the numerical range.

Key words. Numerical range, Inverse problem, Field of values, Geometric computing, Generating vector.

AMS subject classifications. 15A29, 15A60, 15A24, 65F30, 65J22.

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[†]Department of Mathematics, National Technical University of Athens, Zografou Campus, 15780 Athens, Greece (horjoe@yahoo.gr, Ch. Chorianopoulos; ppsarr@math.ntua.gr, P. Psarrakos).

[‡]Department of Mathematics and Statistics, Auburn University, Auburn, AL 36849-5310, USA (uhligfd@auburn.edu).