On the field of values of some tridiagonal matrices

Rute Lemos[1]

[1] *CIDMA and Department of Mathematics, University of Aveiro, Portugal*
E-mail: `rute@ua.pt`

Abstract

The field of values, or numerical range, of a n-square matrix A is the subset of the complex plane denoted and defined by $W(A) = \{x^*Ax : x \in \mathbb{C}^n, x^*x = 1\}$. It is a convex set, as asserted by the famous Toeplitz-Hausdorff Theorem [2, 3], containing the spectrum of A. This concept has been intensively investigated, due to its theoretical interest and applications. The Elliptical Range Theorem characterizes $W(A)$ if $n = 2$ and the elliptical shape persists in certain cases [1], independently of the size of A.

In this talk, the field of values of some tridiagonal matrices and their boundary generating curves, are explored. Some of these boundary generating curves are ellipses or oval shaped. This is based on a joint work with Natália Bebiano (CMUC, University of Coimbra) and Graça Soares (CMAT-UTAD, University of Trás-os-Montes e Alto Douro).

References

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