

SEMINAR

Grupo de Análise Funcional e Aplicações Functional Analysis and Applications Group

Numerical range of a quaternionic operator

Cristina Diogo

ISCTE – Instituto Universitário de Lisboa

Abstract

The numerical range is the image of the unit sphere under a quadratic form, whose geometric structure depends on the ground field. For instance, when we have a complex Hilbert space, the numerical range is a convex set, as stated by the Toeplitz Hausdorff Theorem. However, in the quaternionic case, the convexity of the numerical range may fail. Moreover, for a given operator it is very difficult to characterize its numerical range. Its shape is, for the most part, unknown. One of the exceptions regarding the study of convexity and shape of the numerical range is the case of normal operators. In this talk we are concerned with the numerical range for bounded linear operators on quaternionic Hilbert spaces and its relation with the spectrum, extending to the quaternionic setting some results of complex Hilbert spaces. In addition, we characterize the shape of the quaternionic numerical range of normal operators.

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