ID de Contribution: **4** Type: **Non spécifié**

About Diagonalisation of Para-Hermitian Matrix

mardi 15 mai 2018 11:00 (30 minutes)

It is well-known that a Hermitian matrix can be diagonalized by means of a unitary matrix. The aim of this talk is to present the extension of this result to polynomial matrices, known as PEVD (Polynomial Eigen Value Decomposition) [1], occurring e.g. in blind equalization.

In this context, the eigenvalues are polynomials instead of scalars. Moreover, polynomials are Laurent polynomials, this means with positive and negative exponents. We will show that in this framework, one can still define unimodular matrices, Smith form and invariant polynomials. We will present the difference between the order (or length) and the degree of a polynomial matrix.

Extending polynomial paraconjugation to polynomial matrix, one defines para-hermitianity. We give some properties of these matrices. Then, we will show that diagonalization of para-hermitian matrices is not always possible. Furthermore we will present some results found in the literature on how to approximate a PEVD.

[1] J. G. McWhirter, P. D. Baxter, T. Cooper, S. Redif, and J. Foster, An EVD algorithm for Para-Hermitian polynomial matrices, IEEE Transactions on Signal Processing, vol. 55, no. 6, June 2007, pp. 2158-2169.

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