Mathematics > Operator Algebras

Factorization of Matrices of Quaternions

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We review known factorization results in quaternion matrices. Specifically, we derive the Jordan canonical form, polar decomposition, singular value decomposition, the QR factorization. We prove there is a Schur factorization for commuting matrices, and from this derive the spectral theorem. We do not consider algorithms, but do point to some of the numerical literature.
Rather than work directly with matrices of quaternions, we work with complex matrices with a specific symmetry based on the dual operation. We discuss related results regarding complex matrices that are self-dual or symmetric, but perhaps not Hermitian.

Comments:	Corrected proofs of Theorem 2.4(2) and Theorem 3.2
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