

HAMILTONIAN SQUARE ROOTS OF SKEW HAMILTONIAN QUATERNIONIC MATRICES*

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Abstract. Criteria for existence of Hamiltonian quaternionic matrices that are square roots of a given skew Hamiltonian quaternionic matrix are developed. The criteria are formulated in terms of respective canonical forms of skew Hamiltonian quaternionic matrices. The Hamiltonian property is understood with respect to either the quaternionic conjugation, or an involutory antiautomorphism of the quaternions which is different from the quaternionic conjugation. Many results are stated and proved in a more general framework of symmetric and skewsymmetric matrices with respect to an invertible matrix which is skewsymmetric relative to an involutory antiautomorphism.

Key words. Hamiltonian matrix, Skew Hamiltonian matrix, Quaternion, Square root.

AMS subject classifications. 15A21, 15A33.

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