TWO SPECIAL KINDS OF LEAST SQUARES SOLUTIONS FOR THE QUATERNION MATRIX EQUATION $AXB + CXD = E$ *

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Abstract. By using the complex representation of quaternion matrices, the Moore–Penrose generalized inverse and the Kronecker product of matrices, the expressions of the least squares $\eta$-Hermitian solution with the least norm and the expressions of the least squares $\eta$-anti-Hermitian solution with the least norm are derived for the matrix equation $AXB + CXD = E$ over quaternions.

Key words. Matrix equation, Least squares solution, $\eta$-Hermitian matrix, $\eta$-Anti-Hermitian matrix, Moore–Penrose generalized inverse, Kronecker product, Quaternion matrices.

AMS subject classifications. 65F05, 65H10, 15A33.

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