# Algebraic Techniques for Least Squares Problems in Elliptic Complex Matrix Theory and Their Applications

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**Abstract**

In this study, we introduce concepts of norms of elliptic complex matrices and derive the least squares solution, the pure imaginary least squares solution, and the pure real least squares solution with the least norm for the elliptic complex matrix equation AX=B by using the real representation of elliptic complex matrices. To prove the authenticity of our results and to distinguish them from existing ones, some illustrative examples are also given. Elliptic numbers are generalized form of complex and so real numbers. Thus, the obtained results extend, generalize and complement some known least squares solutions results from the literature.

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