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Kiržner, V. M.

A criterion for the representability of a matrix in the form of a product of a lower-triangular and an upper-trianglar matrix. (Russian)

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A matrix A of order n is said to be T-factorable if there exists a lower-triangular matrix B and an upper-triangular matrix C such that $A = BC$. Denote by $A_1^{(m)}$ the rectangular matrix consisting of the first m rows of the matrix A, and by $A_2^{(m)}$ the rectangular matrix consisting of the first m columns of the same matrix A. Denote by $A_0^{(m)}$ the square matrix which consists of the elements common to both $A_1^{(m)}$ and $A_2^{(m)}$. Theorem: A matrix A is T-factorable if and only if $r(A_1^{(m)}) + r(A_2^{(m)}) - r(A_0^{(m)}) \leq m$ $(1 \leq m \leq n)$, where $r(A_j^{(m)})$, $j = 0, 1, 2$, denotes the rank of $A_j^{(m)}$. *G. Biriuk*