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ZERO-TERM RANK PRESERVERS OF INTEGER MATRICES

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Abstract

The zero-term rank of a matrix is the minimum number of lines (row or columns) needed to cover all the zero entries of the given matrix. We characterize the linear operators that preserve the zero-term rank of the $m \times n$ integer matrices. That is, a linear operator T preserves the zero-term rank if and only if it has the form $T(A) = P(A \circ B)Q$, where P, Q are permutation matrices and $A \circ B$ is the Schur product with B whose entries are all nonzero integers.

Key words and phrases: linear operator, term-rank, zero-term rank, (P, Q, B)-operator.

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