Sign patterns that allows a positive or nonnegative left inverse

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Abstract

An \( m \times n \) sign pattern \( S \) is an \( m \times n \) matrix with entries in \( \{+, -, 0\} \). Such a sign pattern allows a positive (resp. nonnegative) left inverse provided that there exist an \( m \times n \) matrix \( A \) with sign pattern \( S \) and an \( n \times m \) matrix \( B \) with only positive (resp. nonnegative) entries satisfying \( BA=I \). We characterize that \( m \times n \) sign patterns that allow a positive left inverse, and the \( m \times n \) sign patterns that allow a nonnegative left inverse. This is joint work with In-Jae Kim, Dale Olesky and Pauline van den Driessche.