

1 Some properties of the class sign regular matrices and its subclasses

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An $m \times n$ matrix is called *sign regular* with signature ε if, for each $k \leq \min\{m, n\}$, all its $k \times k$ minors have the same sign or are zero. The common sign may differ for different k : the corresponding sequence of signs provides the signature of the sign regular matrix. These matrices play an important role many fields, such as Statistics, Approximation Theory or Computer Aided Geometric Design. In fact, nonsingular sign regular matrices are characterized as variation-diminishing linear maps: the maximum number of sign changes in the consecutive components of the image of a nonzero vector is bounded above by the minimum number of sign changes in the consecutive components of the vector. We study several properties of these matrices, focusing our analysis on some subclasses of sign regular matrices with certain particular signatures.