

# Theory and applications of generalized even and odd oscillatory matrices

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## Abstract

A real matrix  $\mathbf{A}$  is called even (odd) oscillatory if all minors of even (respectively, odd) order of  $\mathbf{A}$  are nonnegative and there exists a natural number  $m$  such that all minors of even (respectively, odd) order of  $\mathbf{A}^m$  are positive (see [1], [2]). This talk concerns a wide class of matrices, which is a cone-theoretic generalization of the class of even (odd) oscillatory matrices. The results describing eigenvalues and Jordan basis of generalized even (odd) oscillatory matrices are presented. The connections between the generalized even (odd) oscillation,  $K$ -monotonicity and the matrix stability are discussed. Examples of generalized even (odd) oscillatory matrices of a special structure are given.

## Keywords

Cones of rank  $k$ , Cone-preserving maps, Oscillatory matrices, Sign-symmetric matrices, Stability, Exterior products, Eigenvalues.

## References

- [1] Kalafati, P.D. (1940). Green functions of ordinary differential equations. *Dokl. Akad. Nauk SSSR* 26, 535–539.
- [2] Kalafati, P.D. (1962). Oscillatory properties of fundamental functions in third-order boundary-value problems. *Dokl. Akad. Nauk SSSR* 143, 518–521.