

## NUMERICAL RADIUS OF PRODUCTS OF SPECIAL MATRICES

MOHAMMAD ALAKHRASS

*Abstract.* The purpose of this note is to present upper bounds estimations for the numerical radius of a products and Hadamard products of special matrices, including sectorial and accretive-dissipative matrices.

*Mathematics subject classification (2020):* 15A45, 15A60, 47A12, 47A30.

*Keywords and phrases:* Numerical radius, sectorial matrices, accretive-dissipative matrices, matrix inequalities.

### REFERENCES

- [1] M. ALAKHRASS, *On sectorial matrices and their inequalities*, Linear Algebra and its Applications **617**, 179–189 (2021).
- [2] M. ALAKHRASS, M. SABABHEH, *Lieb functions and sectorial matrices*, Linear Algebra Appl. **586**, 308–324 (2020).
- [3] M. ALAKHRASS, *A note on sectorial matrices*, Linear Multilinear Algebra, vol. 68, no. 11, pp. 2228–2238, 2020.
- [4] YU. M. ARLINSKI, A. B. POPOV, *On sectorial matrices*, Linear Algebra Appl. 2003; 370: 133–146.
- [5] T. ANDO, K. OKUBO, *Induced norms of the Schur multiplier operator*, Linear Algebra Appl. **147** (1991) 181–199.
- [6] R. BHATIA, *Matrix Analysis*, Springer, Berlin (1997).
- [7] R. A. HORN AND C. A. JOHNSON, *Topics in Matrix Analysis*, Cambridge, England: Cambridge University Press, 1991.
- [8] K. E. GUSTAFSON, D. K. M. RAO, *Numerical Range*, Springer, New York, 1997.
- [9] H.-L. GAU, P. Y. WU, *Numerical radius of Hadamard product of matrices*, Linear Algebra Appl. **504** (2016) 292–308.
- [10] S. DRURY, M. LIN, *Singular value inequalities for matrices with numerical ranges in a sector*, Oper. Matrices **8** (2014) 1143–1148.
- [11] M. LIN, *Some inequalities for sector matrices*, Operators and Matrices **10** (2016) 915–921.
- [12] M. LIN, F. SUN, *A property of geometric mean of accretive operators*, Linear Multilinear Algebra **65** (3), 433–437 (2017).
- [13] F. ZHANG, *A matrix decomposition and its applications*, Linear Multilinear Algebra **10** (2015) 2033–2042.