

## INEQUALITIES INVOLVING THE KHATRI-RAO PRODUCT OF MATRICES

## Jadranka Mićić

Abstract. We shall show several complementary inequalities to Jensen's type inequality involving the Khatri-Rao product of maps on positive definite matrices. They are applied to extend some known inequalities involving powers of the Khatri-Rao product. Finally, we have generalized some known results for the Hadamard product of operators.

Mathematics subject classification (2000): 15A45, 15A69.

*Keywords and phrases*: Matrix inequality, Khatri-Rao product, Tracy-Singh product, Hadamard product, Kronecker product, Mond-Pečarić method.

## REFERENCES

- [1] J. S. AUJLA AND H. L. VASUDEVA, Inequalities involving Hadamard product and operator means, Math. Japon. 42 (1995), 265–272.
- [2] C. CAO, X. ZHANG AND Z. YANG, Some inequalities for the Khatri-Rao product of matrices, Elect. J. Linear Alg., 9 (2002), 276–281.
- [3] J. I. Fujii, The Marcus-Khan theorem for Hilbert space operators, Math. Japon., 41 (1995), 531–535.
- [4] T. FURUTA, J. MIĆIĆ HOT, J. PEČARIĆ AND Y. SEO, Mond-Pečarić method in operator inequalities, Element, Zagreb, 2005.
- [5] R. H. KONING, H. NEUDECKER AND T. WANSBEEK, Block Kronecker products and the vecb operator, Linear Algebra Appl., 149 (1991), 165–184.
- [6] S. LIU, Matrix results on the Khatri-Rao and Tracy-Singh products, Linear Alg. Appl., 289 (1999), 267–277.
- [7] S. LIU, Some inequalities involving Khatri-Rao product of positive semi-definite matrices, Linear Alg. Appl., 354 (2002), 175–186.
- [8] J. MIĆIĆ AND J. PEČARIĆ, Order among power means of positive operators, II, submitted to Sci. Math. Japon.
- [9] J. MIĆIĆ, J. PEČARIĆ AND Y. SEO, Function order of positive operators based on the Mond-Pečarić method, Linear Alg. Appl., 360 (2003), 15–34.
- [10] J. MIĆIĆ, J. E. PEČARIĆ, Y. SEO AND M. TOMINAGA, Inequalities for positive linear maps on Hermitian matrices, Math. Inequal. Appl., 3 (2000), 559–591.
- [11] J. PEČARIĆ AND J. MIĆIĆ, Some function reversing the order of positive operators, Linear Alg. Appl., 396 (2005), 175–187.
- [12] Z. A. AL ZHOUR AND A. KILICMAN, Extension and generalization inequalities involving the Khatri-Rao product of several positive matrices, J. Inequal. Appl., 2006 (2006), 1–21.

