

## SOME INEQUALITIES RELATED TO $M$ -MATRICES

MIROSLAV FIEDLER AND VLASTIMIL PTÁK

*Abstract.* Several different forms of a Euler type inequality are investigated and their relation to  $M$ -matrices and doubly stochastic matrices is exhibited. The results are applied to the study of positive biquadratic forms.

*Mathematics subject classification (1991):* 15A45, 26D15.

*Key words and phrases:* Inequality,  $M$ -matrix, doubly stochastic matrix, biquadratic form.

### REFERENCES

- [1] C. BINDSCHEIDLER, *Lösung der Aufgabe 329 (J. Berkes)*, *Elemente Math.* **14** (1965), 132.
- [2] M.-D. CHOI, *Positive semidefinite biquadratic forms*, *Linear Alg. Appl.* **12** (1975), 95–100.
- [3] M. FIEDLER, V. PTÁK, *On matrices with non-positive off-diagonal elements and positive principal minors*, *Czechoslovak Math. J.* **87** (1962), 382–400.
- [4] H. KOBER, *On the arithmetic and geometric mean and on Hölder's inequality*, *Proc. Amer. Math. Soc.* **9** (1958), 452–459.
- [5] D. S. MITRINOVIĆ, *Nejednakosti*, Beograd, 1965.