

Representations of $\{3\}$, $\{4\}$, $\{1, 3\}$, $\{1, 4\}$ Inverses

PREDRAG STANIMIROVIĆ AND MIROSLAV RISTIĆ

ABSTRACT. In this paper we obtain a general solution of the Penrose's equation (3), solution of the equation (4) and a general solution of the system of Penrose's equations (1),(3) and (1),(4). We also introduce a determinantal representation of the classes of $\{3\}$, $\{4\}$, $\{1, 3\}$ and $\{1, 4\}$ -inverses of complex matrices.

REFERENCES

- [1] E. Arghiriade and A. Dragomir, *Une nouvelle definition de l'inverse generalisee d'une matrice*, Lincei – Rend. Sc. fis. mat. e nat., **XXXV** (1963), 158–165.
- [2] A. Ben-Israel and T.N.E. Greville, *Generalized Inverses: Theory and applications*, Wiley-Interscience, New York, 1974.
- [3] A. Ben-Israel, *Generalized inverses of matrices: a perspective of the work of Penrose*, Math. Proc. Camb. Phil. Soc., **100** (1986), 407–425.
- [4] R. Gabriel, *Extinderea complementilor algebrici generalizati la matrici oarecare*, Studii si Cercetari Matematice, **17 -Nr. 10** (1965), 1566–1581.
- [5] R. Gabriel, *Das verallgemeinerte inverse einer Matrix, deren Elemente einem beliebigen Körper angehören*, Rewie ansew Math., **234** (1967), 107–122.
- [6] R. Gabriel, *Das verallgemeinerte inverse einer matrix, über einem beliebigen Körper – analytisch betrachtet*, J. Rewie ansew Math., **244(V)** (1970), 83–93.
- [7] R.E. Hartwig, *Block generalized inverses*, Arch. Rational Mech. Anal., **61** (1976), 197–251.
- [8] R.A. Horn and C.R. Johnson, *Matrix Analysis*, Cambridge University press, Cambridge, New York, Melbourne, Sydney, 1985.
- [9] E.H. Moore, *On the reciprocal of the general algebraic matrix (Abstract)*, Bull. Amer. Math. Soc., **26** (1920), 394–395.
- [10] R. Penrose, *A generalized inverse for matrices*, Proc. Cambridge Philos. Soc., **51** (1955), 406–413.
- [11] M. Radić, *Some contributions to the inversion of rectangular matrices*, Glasnik Matematički, **1(21)** No. 1 (1966), 23–37.

1991 *Mathematics Subject Classification.* Primary: 15A09, 15A60; Secondary: 65F35.

Key words and phrases. Penrose's equation, System of Penrose's, Characterization of inverses, Determinantal representation.

- [12] P. Stanimirović and M. Stanković, *Generalized algebraic complement and Moore-Penrose inverse*, Filomat, **8** (1994), 57–64.
- [13] P. Stanimirović and M. Stanković, *Determinantal representation of weighted Moore-Penrose inverse*, Matematički Vesnik, **46** (1994), 41–50.

DEPARTMENT OF MATHEMATICS
FACULTY OF SCIENCE
UNIVERSITY OF NIŠ
VIŠEGRADSKA 33
18000 NIŠ
SERBIA AND MONTENEGRO
E-mail address: pecko@pmf.ni.ac.yu

DEPARTMENT OF MATHEMATICS
FACULTY OF SCIENCE
UNIVERSITY OF NIŠ
VIŠEGRADSKA 33
18000 NIŠ
SERBIA AND MONTENEGRO
E-mail address: mristic@ptt.yu