

AN ITERATIVE SCHEME FOR A SYSTEM OF QUASI VARIATIONAL INEQUALITIES

MUHAMMAD ASLAM NOOR¹ AND ZHENYU HUANG²

Abstract. In this paper, we consider a new system of quasi variational inequalities involving two different operators. Using the projection technique, we suggest and analyze a new iterative method for solving this system of quasi variational inequalities. We also prove the convergence of this iterative method under some mild conditions. As a special case, our results include the results of Huang and Noor [6] for solving system of variational inequalities.

Mathematics subject classification (2000): 49J40, 65B05, 47H17.

Key words and phrases: quasi variational inequalities, a system of quasi variational inequalities involving two different operators, relaxed (γ, r) -cocoercive mappings.

REFERENCES

- [1] C. BAIocchi, A. CAPELO, Variational and Quasi Variational Inequalities, Wiley, New York, 1984.
- [2] P. DANIELE, F. GIANNESI, AND A. MAUGERI, Equilibrium problems and variational models, Kluwer Academic Publishers, United Kingdom, 2003.
- [3] F. GIANNESI AND A. MAUGERI, Variational inequalities and network equilibrium problems, Plenum Press, New York, 1995.
- [4] F. GIANNESI, A. MAUGERI AND P. M. PARDALOS, Equilibrium problems, nonsmooth optimization and variational inequalities problems, Kluwer Academic Publishers, Dordrecht Holland, 2001.
- [5] R. GLOWINSKI, J. L. LIONS AND R. TREMOLIERES, Numerical analysis of variational inequalities, North-Holland, Amsterdam, Holland, 1981.
- [6] ZHENYU HUANG AND M. ASLAM NOOR, *An explicit projection method for a system of nonlinear variational inequalities with different (γ, r) -cocoercive mappings*, Applied Mathematics and Computation (2007) (in press)
- [7] M. MOSCO, Implicit variational problems and quasi-variational inequalities, Nonlinear Operators and the Calculus of Variations, Lecture Notes in Mathematics, Springer Verlag, New York, New York, **543**, pp. 83–126, 1976.
- [8] A. NAGURNEY, D. ZHANG, Projected Dynamical Systems and Variational Inequalities with Applications, Kluwer Academic Publishers, Dordrecht, 1996.
- [9] M. ASLAM NOOR, *Sensitivity analysis for quasi-variational inequalities*, Journal of Optimization Theory and Applications **95**(2) (1997), 399–407.
- [10] M. ASLAM NOOR, *Generalized quasi variational inequalities and implicit Wiener-Hopf equations*, Optimization **45** (1999), 197–222.
- [11] M. ASLAM NOOR, *Extragradient method for pseudomonotone variational inequalities*, Journal of Optimization Theory and Applications **117** (2003) 475–488.
- [12] M. ASLAM NOOR, *Some developments in general variational inequalities*, Applied Mathematics and Computation **152** (2004), 199–277.
- [13] M. PATRIKSSON, Nonlinear Programming and Variational Inequalities: A Unified Approach, Kluwer Academic Publishers, Dordrecht, 1998.
- [14] R. U. VERMA, *Generalized system for relaxed cocoercive variational inequalities and projection methods*, Journal of Optimization Theory and Applications **121**(1) (2004), 203–210.

- [15] X. L. WENG, *Fixed point iteration for local strictly pseudocontractive mappings*, Proceedings of the American Mathematical Society **113** (1991), 727–731.
- [16] D. L. ZHU AND P. MARCOTTE, *Cocoercivity and its role in the convergence of iterative schemes for solving variational inequalities*, SIAM J. Optimization **6**(1996), 714–726.