

SENSITIVITY ANALYSIS FOR PARAMETRIC GENERAL SET-VALUED MIXED VARIATIONAL-LIKE INEQUALITY IN UNIFORMLY SMOOTH BANACH SPACE

K. R. KAZMI AND F. A. KHAN

Abstract. In this paper, using the concept of P - η -proximal mapping, we study the existence and sensitivity analysis of solution of a parametric general set-valued mixed variational-like inequality problem in uniformly smooth Banach space. The approach used in this paper may be treated as the extension and unification of approaches for studying sensitivity analysis for various important classes of variational inequalities given by many authors, see for example [2, 4, 6-8, 14, 15, 17-19].

Mathematics subject classification (2000): 49J40, 47H05, 47J25, 47J20, 49J53.

Key words and phrases: parametric general variational-like inequality, P - η -proximal mapping, strongly mixed accretive mapping, mixed Lipschitz continuous mapping, generalized mixed pseudocontractive mapping, relaxed mixed Lipschitz mapping, sensitivity analysis.

REFERENCES

- [1] S. ADLY, *Perturbed algorithms and sensitivity analysis for a general class of variational inclusions*, J. Math. Anal. Appl., **201**, (3) (1996), 609–630.
- [2] R. P. AGARWAL, Y. J. CHO AND N. J. HUANG, *Sensitivity analysis for strongly nonlinear quasi-variational inclusions*, Appl. Math. Lett., **13**, (2002), 807–828.
- [3] C. BAIOCCHI, A. CAPELO, *Variational and Quasi-variational Inequalities: Applications to Free Boundary Problems*, John Wiley and Sons, New York, 1984.
- [4] S. DAFERMOS, *Sensitivity analysis in variational inequalities*, Math. Oper. Res., **13**, (1998), 421–434.
- [5] X. P. DING, *Generalized quasi-variational-like inclusions with nonconvex functional*, Appl. Math. Comput., **122**, (2001), 267–282.
- [6] X. P. DING, *Sensitivity analysis for generalized nonlinear implicit quasi-variational inclusions*, Appl. Math. Lett., **17**, (2) (2004), 225–235.
- [7] X. P. DING, *Parametric completely generalized mixed implicit quasi-variational inclusions involving h -maximal monotone mappings*, J. Comput. Appl. Math., **182**, (2) (2005), 252–269.
- [8] X. P. DING, C. L. LUO, *On parametric generalized quasi-variational inequalities*, J. Optim. Theory Appl., **100**, (1999), 195–205.
- [9] F. GIANNESI, A. MAUGERI, *Variational Inequalities and Network Equilibrium Problems*, Plenum Press, New York, 1995.
- [10] K. GOEBEL, S. REICH, *Uniform Convexity, Hyperbolic Geometry and Nonexpansive Mappings*, Marcel Dekker, New York, 1995.
- [11] K. R. KAZMI, M. I. BHAT, *Convergence and stability of iterative algorithms of generalized set-valued variational-like inclusions in Banach spaces*, Appl. Math. Comput., **166**, (2005), 164–180.
- [12] N. KIKUCHI, J. T. ODEN, *Contact Problems in Elasticity, A Study of Variational Inequalities and Finite Element Methods*, SIAM, Philadelphia, 1988.
- [13] T. C. LIM, *On fixed point stability for set-valued contractive mappings with applications to generalized differential equation*, J. Math. Anal. Appl., **110**, (1985), 436–441.

- [14] Z. LIU, L. DEBNATH, S. M. KANG AND J. S. UME, *Sensitivity analysis for parametric completely generalized nonlinear implicit quasi-variational inclusions*, J. Math. Anal. Appl., **277**, (1) (2003), 142–154.
- [15] R. N. MUKHERJEE, H. L. VERMA, *Sensitivity analysis of generalized variational inequalities*, J. Math. Anal. Appl., **167**, (1992), 299–304.
- [16] S. B. NADLER JR, *Multivalued contractive mappings*, Pacific J. Math., **30**, (1969), 475–488.
- [17] M. A. NOOR, *Sensitivity analysis framework for general quasi-variational inclusions*, Comput. Math. Appl., **44**, (2002), 1175–1181.
- [18] M. A. NOOR, *Sensitivity analysis for quasivariational inclusions*, J. Math. Anal. Appl., **236**, (1999), 290–299.
- [19] J. Y. PARK, J. U. JEONG, *Parametric generalized mixed variational inequalities*, Appl. Math. Lett., **17**, (2004), 43–48.
- [20] S. M. ROBINSON, *Sensitivity analysis for variational inequalities by normal-map technique*, in: F. Giannessi, A. Maugeri (Eds.), Variational Inequalities and Network Equilibrium problems, Plenum Press, New York, (1995), 257–269.
- [21] N. D. YEN, *Hölder continuity of solutions to a parametric variational inequality*, Appl. Math. Optim., **31**, (1995), 245–255.