

## A NEW SYSTEM OF SET-VALUED VARIATIONAL INCLUSIONS WITH $H$ -MONOTONE OPERATORS

WEN-YONG YAN, YA-PING FANG AND NAN-JING HUANG

*Abstract.* The purpose of this paper is to introduce and study a new system of set-valued variational inclusions with  $H$ -monotone operators in Hilbert spaces. By using the resolvent operator method associated with  $H$ -monotone operator due to Fang and Huang, we construct a new iterative algorithm for solving this kind of system of set-valued variational inclusions. We also prove the existence of solutions for the system of set-valued variational inclusions and the convergence of iterative sequences generated by the algorithm.

*Mathematics subject classification (2000):* 49J40, 47H10.

*Key words and phrases:*  $H$ -monotone operator, resolvent operator technique, system of set-valued variational inclusion, iterative algorithm.

### REFERENCES

- [1] S. ADLY, *Perturbed algorithm and sensitivity analysis for a general class of variational inclusions*, J. Math. Anal. Appl. **201** (1996), 609–630.
- [2] R. AHMAD AND Q. H. ANSARI, *An iterative algorithm for generalized nonlinear variational inclusions*, Appl. Math. Lett. **13** 5 (2000), 23–26.
- [3] Y. J. CHO, Y. P. FANG, N. J. HUANG AND H. J. HWANG, *Algorithms for systems of nonlinear variational inequalities*, J. Korean Math. Soc. **41** (2004), 489–499.
- [4] Y. P. FANG AND N. J. HUANG,  *$H$ -Monotone operator and resolvent operator technique for variational inclusions*, Appl. Math. Comput. **145** (2003), 795–803.
- [5] Y. P. FANG AND N. J. HUANG, *Existence results for systems of strongly implicit vector variational inequalities*, Acta Math. Hungar. **103**(2004), 265–277.
- [6] Y. P. FANG AND N. J. HUANG,  *$H$ -monotone operators and system of variational inclusions*, Commun. Appl. Nonlinear Anal. **11** 1 (2004), 93–101.
- [7] N. J. HUANG, *Generalized nonlinear variational inclusions with noncompact valued mappings*, Appl. Math. Lett. **9**(3) (1996), 25–29.
- [8] N. J. HUANG, *Mann and Ishikawa type perturbed iterative algorithms for generalized nonlinear implicit quasi-variational inclusions*, Comput. Math. Appl. **35** 10 (1998), 1–7.
- [9] N. J. HUANG, *A new completely general class of variational inclusions with noncompact valued mappings*, Comput. Math. Appl. **35** 10 (1998), 9–14.
- [10] N. J. HUANG AND Y. P. FANG, *Fixed point theorems and a new system of multivalued generalized order complementarity problems*, Positivity **7** (2003), 257–265.
- [11] G. KASSAY AND J. KOLUMBÁN, *System of multi-valued variational inequalities*, Publ. Math. Debrecen **56** (2000), 185–195.
- [12] G. KASSAY, J. KOLUMBÁN AND Z. PÁLES, *Factorization of Minty and Stampacchia variational inequality system*, European J. Operational Research **143**(2) (2002), 377–389.
- [13] J. K. KIM AND D. S. KIM, *A new system of generalized nonlinear mixed variational inequalities in Hilbert spaces*, J. Convex Anal. **11** (2004), 117–124.
- [14] C. H. LEE, Q. H. ANSARI AND J. C. YAO, *A perturbed algorithm for strongly nonlinear variational-like inclusions*, Bull. Austral. Math. Soc. **62** (2000), 417–426.

- [15] L. W. LIU AND Y. Q. LI, *On generalized set-valued variational inclusions*, J. Math. Anal. Appl. **261** 1 (2001), 231–240.
- [16] S. B. NADLER, *Multivalued contraction mappings*, Pacific J. Math. **30** (1969), 475–488.
- [17] R. U. VERMA, *Iterative algorithms and a new system of nonlinear quasivariational inequalities*, Adv. Nonlinear Var. Inequal. **4** 1 (2001), 117–124.
- [18] R. U. VERMA, *Projection methods, algorithms, and a new system of nonlinear variational inequalities*, Comput. Math. Appl. **41** (2001), 1025–1031.
- [19] R. U. VERMA, *Generalized system for relaxed coercive variational inequalities and projection methods*, J. Optim. Theory Appl. **121** (2004), 203–210.
- [20] E. ZEIDLER, *Nonlinear Functional Analysis and its Applications II: Monotone Operators*, Springer-Verlag, Berlin, 1985.