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A New Class of Generalized Nonlinear Fuzzy Set-Valued Variational Inclusions Involving (H, η) -Monotone Mappings①

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Abstract: In this paper, a new class of generalized nonlinear fuzzy set-valued variational inclusions in Hilbert spaces is introduced and studied, and an existence theorem of solutions and a new iterative algorithm for this class of variational inclusions is suggested and discussed. The results presented in this paper generalize and improve some recent results in this field.

Key words: variational inclusions; (H, η)-monotone mapping; fuzzy set-valued mapping; convergence; iterative algorithm

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Form 1989, [1－4] introduced and studied some existence theorems of solutions and some iterative algorithms for several kinds of fuzzy set-valued variational inclusions and inequalities. On the other hand, [5] studied a new class of generalized monotone mappings, (H, η) -monotone mappings.

Inspired and motivated by recent research works in this field, a new class of generalized nonlinear fuzzy set-valued variational inclusions in Hilbert spaces is introduced and studied. By using the resolvent operator associated with (H, η) -monotone mappings, an existence theorem of solutions and a new iterative algorithm for this class of variational inclusions is suggested and discussed. The results presented in this paper generalize and improve some recent results in [1－4,6].

1 Preliminaries

Let X be a real Hilbert space with a norm $\|\cdot\|$ and an inner product $\langle\cdot,\cdot\rangle$, and $\mathscr{F}(X)$ be a collection of all fuzzy sets over X. Let $\hat{S}$, $\hat{T}$, $\hat{G}$ and $\hat{P}$: $X \longrightarrow \mathscr{F}(X)$ be four fuzzy mappings satisfying the condition

(＊) there exists four functions a,b,c,d: $X \longrightarrow [0, 1]$ such that for all $x \in X$, we have $(\hat{S}_x)_{a(x)}$, $(\hat{T}_x)_{b(x)}$, $(\hat{G}_x)_{c(x)}$, $(\hat{P}_x)_{d(x)} \in CB(X)$, where $CB(X)$ denotes the family of all nonempty bounded closed subsets of X.

If letting $S(x) = (\hat{S}_x)_{a(x)}$, $T(x) = (\hat{T}_x)_{b(x)}$, $G(x) = (\hat{G}_x)_{c(x)}$, $P(x) = (\hat{P}_x)_{d(x)}$, then S,T,G, and

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