*Dynamics of Continuous, Discrete and Impulsive Systems*
*Series* **A:** *Mathematical Analysis* **11 (2004)** 491-502


# SET-VALUED QUASIVARIATIONAL INCLUSIONS AND IMPLICIT RESOLVENT EQUATIONS IN BANACH SPACES

Jong Kyu Kim[1], Ki Hong Kim[2] and Kyung Soo Kim[3]

[1] Department of Mathematics,
Kyungnam University, Masan 631-701, Korea
[2] Department of Mathematics,
Kyungnam University, Masan 631-701, Korea
[3] Department of Mathematics,
Kyungnam University, Masan 631-701, Korea

**Abstract.** In this paper, we introduce and study a new class of more general set-valued quasivariational inclusions in Banach spaces. By using the resolvent operator technique, some existence theorems of solutions and iterative approximation for solving the set-valued quasivariational inclusions are established. The results of this paper generalize and improve a number of Noor's results [15,17] and other recent results.
**Keywords.** Set-valued quasivariational inclusion, implicit resolvent equation, $m-$accretive mapping.
**AMS (MOS) subject classification: 47H06, 47J20, 47J30, 49J40.**

# 1 Introduction

In recent years, variational inequalities have been extended and generalized in various directions by using novel and innovative ideas and techniques. Useful and significant generalization of variational inequalities is variational inclusions.

Recently, Noor [15,17] introduced and studied the following class of variational inclusion problems in a Hilbert space $H$, which is called the multivalued quasi variational inclusion :

Let $A(\cdot,\cdot) : H \times H \to H$ be a maximal monotone mapping with respect to the first argument, $T, V : H \to C(H)$ be two set-valued mappings, and $g : H \to H$ be a single-valued mapping, where $C(H)$ denotes the family of all nonempty compact subsets of $H$. For a given nonlinear mapping $N(\cdot,\cdot) : H \times H \to H$, find $u \in H$, $w \in T(u)$, and $y \in V(u)$ such that

$$\theta \in N(w, y) + A(g(u), u).$$

Motivated by Noor's results in [15,17], the purpose of this paper is to introduce and study a class of more general set-valued variational inclusions without the compactness condition in Banach spaces. Using the resolvent