# SOLVING MULTIPLE-SETS SPLIT MONOTONE VARIATIONAL INCLUSION PROBLEM IN REAL HILBERT SPACES.*

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## Abstract

In this paper, we study and introduce a self adaptive method together with a Halpern iterative algorithm for approximating solutions of multiple-sets split monotone variational inclusion problem which includes the multiple-sets split feasibility problem, split feasibility problem, split monotone variational inclusion problem and split variational inclusion problem, to mention a few. Using our iterative algorithm, we prove a strong convergence result for approximating the solution of the aforementioned problems. Numerical examples on finite-dimensional and infinite-dimensional spaces are displayed to illustrate the performance of our iterative method. The result discussed in this article extends and complements many related results in literature.

**MSC**: 47H09; 47H10; 47J05; 47J25.

**keywords:** Multiple-sets split monotone variational problem, Halpern method, fixed point problems, Iterative method.