

Meeting: 1005, Newark, Delaware, SS 13A, Special Session on Integral and Operator Equations

1005-47-199 **Jinlu Li*** (jli@shawnee.edu), Department of Mathematics, Shawnee State University, Portsmouth, OH 45662. *Solving Variational Inequalities in Banach Spaces by Using the Generalized Projection and the Metric Projection Operators.* Preliminary report.

Abstract

In 1994, Alber introduced the generalized projections $\mathcal{L}kK : B^{**}_K$ and $\mathcal{L}SK : B''_K$ from Hilbert spaces to uniformly convex and uniformly smooth Banach spaces and studied their properties in detail and presented some applications in a Banach space.

Recently, the present author extended the generalized projection operator $\mathcal{L}kK : B^{**}_K$ from uniformly convex and uniformly smooth Banach spaces to reflexive Banach spaces and studied its proximal property, Chebyshev set property, continuity property and some applications to solving variational inequalities. The normalized duality mapping J is a mapping from B to $2B^*$ and the normalized duality mapping J^* is a mapping from B^* to $2B^{**}$. By the composition of J^* and PK , we get a mapping $PKJ^* : B^{**}_K$.

In this paper we study the following three parts:

- Part 1. the relationship between the operators $\mathcal{L}kK$ and PKJ^* in general Banach spaces;
- Part 2. studying the existence of solution of variational inequality problems by using the operators $\mathcal{L}kK$ and PKJ^* ;
- Part 3. approximating the solutions of variational inequality problems by using the operators $\mathcal{L}kK$ and PKJ^* .

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