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SOME REMARKS ON WIENER-HOPF EQUATIONS AND VARIATIONAL INEQUALITIES IN BANACH SPACES

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Abstract : In this paper, we consider a class of implicit variational inequalities in Banach spaces and prove its equivalence with a class of Wiener-Hopf equations. Further, using this equivalence, we suggest and analyze a Mann type iterative algorithm for finding the appropriate solution of the class of Wiener-Hopf equation and discuss its convergence criteria. The theorems in the paper extend and improve many known results in the literature.

Keywords : Implicit variational inequality, Wiener-Hopf equation, Mann type iterative algorithm, sunny retraction, η-strongly accretive mapping.

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1. Introduction :

Let B be a real Banach space and let $T, g: B \to B$ be two nonlinear mappings. Let K be a non-empty closed convex set in B, we consider an implicit variational inequality problem (IVIP) of finding $u \in B$ such that $g(u) \in K$ and

$$\langle Tu, J(v - g(u)) \rangle \geq 0, \quad \forall v \in K, \tag{1.1}$$

where $J: B \to B^*$ is the normalized duality mapping defined by the condition:

$$\langle x, Jx \rangle = ||x||^2 = ||Jx||^2, \quad \forall x \in B,$$