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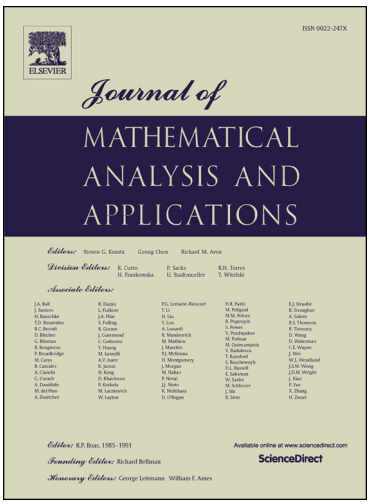

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Stochastic weighted variational inequalities in non-pivot Hilbert spaces with applications to a transportation model

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Abstract

A class of stochastic weighted variational inequalities in non-pivot Hilbert spaces is proposed. Existence and continuity results are proved. These theoretical results play a prominent role in order to introduce a new weighted transportation model with uncertainty. Moreover, they allow to establish the equivalence between the random weighted equilibrium principle and a suitable stochastic weighted variational inequality. At the end, a numerical model is discussed.

Keywords: Non-pivot Hilbert spaces, Stochastic weighted variational inequalities, Existence, Stochastic continuity, Traffic problem

1. Introduction

In the last years, more and more problems arising from Applied Mathematics, Economics and Engineering, but also from real life, have been modeled by variational inequalities. In particular, variational inequalities provide a unifying framework for the study of various problems including boundary value problems, equilibrium problems and game theory (see, for instance, [1], [2], [3]). Some years ago, the stochastic formulation for a special class of variational inequalities has been studied in [4].

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