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VARIATIONAL PRINCIPLES FOR SUPINF PROBLEMS WITH CONSTRAINTS

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Abstract. Some recent results on variational principles of constrained supinf problems of the form $\sup_{x\in X}\inf_{y\in Kx}\{f(x,y)\}$ are presented. Conditions that ensure validity of the presented results in case of Stackelberg problem are provided.

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1. Introduction

Variational principles are a group of results that concern sufficient conditions under which after a perturbation of a lower semicontinuous function, bounded from below, by a function with an arbitrary small norm, the perturbed minimization problem has a solution. For function of one variable the problem has been extensively studied - Ekeland variational principle [4], Stegall variational principle [15], Borwein-Preiss [1] and Deville-Godefroy-Zizler [3] smooth variational principles, Čoban-Kenderov-Revalski [2] and Kenderov-Revalski [7] continuous variational principles. In case of two variables there are not so many results in the literature. Some of them are due to McLindeden [12] (an application of Ekeland variational principle to minmax problems), Kenderov-Lucchetti [6] (generic variational principles for supinf problems) and Kenderov-Revalski [8] (variational principles for supinf problems, unconstrained case).

In this paper the following supinf problem with constraints is considered

$$(P) \qquad \sup_{x\in X}\inf_{y\in Kx} f(x,y)$$