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Journal of Computational and Applied Mathematics 188 (2006) 165–179

JOURNAL OF
COMPUTATIONAL AND
APPLIED MATHEMATICS

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Descent methods for monotone equilibrium problems in Banach spaces

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Received 27 January 2004; received in revised form 7 April 2005

Abstract

In this paper, we consider equilibrium problems with nonstrictly monotone and differentiable bifunction. We propose a combined regularization and descent method for this problem and establish strong convergence of its iteration sequence.

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MSC: 49M37; 65K10; 47J06; 47J20

Keywords: Equilibrium problem; Monotone bifunction; Regularization method

1. Introduction

Let U be a nonempty subset of a Banach space E and let $f : U \times U \rightarrow R$ be an *equilibrium bifunction*, i.e. $f(u, u) = 0$ for every $u \in U$. Then one can define the general *equilibrium problem* (EP), that is to find an element $u^* \in U$ such that

$$f(u^*, v) \geq 0 \quad \forall v \in U. \quad (1)$$

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