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FORUM

A Note on "Existence Results for Noncoercive Mixed Variational Inequalities in Finite Dimensional Spaces"

Alfredo Iusem[1] · **Felipe Lara**[2]

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Abstract
We correct the proofs of a previous publication.

Keywords Asymptotic analysis · Asymptotic functions · Noncoercive Optimization · Variational Inequalities · Equilibrium Problems

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1 Introduction

We correct the proofs of [1, Corollary 3.1 and Theorem 3.2].

2 The Corrected Proofs

In the proof of [1, Corollary 3.1], we say "Since assumption (Th) holds immediately for $T(x) = Ax + a$". This is not correct, as shown in the example given in the paper itself [1, page 127]. So, given a matrix $A \in \mathbb{R}^{n\times n}$, a vector $a \in \mathbb{R}^n$, and a closed and convex set $K \subset \mathbb{R}^n$, we consider the following assumption:
(Ah): The pair (A, h) has the MVIP on K, with MVIP as defined in [1, Definition 3.1].

Hence, [1, Corollary 3.1] should be rewritten as follows:

✉ Felipe Lara
felipelaraobreque@gmail.com; flarao@uta.cl

Alfredo Iusem
iusp@impa.br

1 Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil

2 Departamento de Matemática, Facultad de Ciencias, Universidad de Tarapacá, Arica, Chile

Corollary 2.1 *Let A be a K-copositive matrix and $a \in \mathbb{R}^n$ such that assumption (Ah) holds. If there exists $x_0 \in K$ such that*

$$h^{\infty}(u) + \langle a - A^{\top} x_0, u \rangle > 0, \quad \forall\, u \in K^{\infty} \backslash \{0\}, \tag{1}$$

then $S(A; h; K)$ is nonempty and compact.

In its proof, we replace "Since assumption (Th) holds immediately for $T(x) = Ax + a$" by "By assumption (Ah), assumption (Th) holds for $T(x) = Ax + a$", and the proof follows.

Analogously, since the proof of [1, Theorem 3.2] is based on [1, Corollary 3.1], we rewrite this theorem as follows:

Theorem 2.1 *Let $h : \mathbb{R}^n \to \mathbb{R}$ be a function, and K a nonempty, closed and convex set from $\mathbb{R}^n$. Suppose that assumptions $(A0)$, $(h0)$ and (Ah) hold. Then,*

$$h^{\infty}(u) + \langle a, u \rangle > 0, \quad \forall\, u \in (K^{\infty} \cap \operatorname{Ker} A) \backslash \{0\} \implies S(A; h; K) \neq \emptyset \text{ and compact.} \tag{2}$$

Finally, in the remainder of the paper, whenever [1, Theorem 3.2] is used, assumption (Ah) should be added.

3 Conclusions

We have corrected the proofs of a published paper.

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Reference

1. Iusem, A., Lara, F.: Existence results for noncoercive mixed variational inequalities in finite dimensional spaces. J. Optim. Theory Appl. **183**, 122–138 (2019)