R. Hu

Dept. of Computational Science, Chengdu University of Information Technology, Chengdu, Sichuan, P. R. China

Y.-P. Fang

Dept. of Mathematics, Sichuan University, Chengdu, Sichuan 610064, P. R. China
`fabhcn@yahoo.com.cn`

Well-Posedness of Inverse Variational Inequalities

Let $\Omega \subset R^P$ be a nonempty closed and convex set and $f : R^P \to R^P$ be a function. The inverse variational inequality is to find $x^* \in R^P$ such that

$$f(x^*) \in \Omega, \quad \langle f' - f(x^*), x^* \rangle \geq 0, \quad \forall f' \in \Omega.$$

The purpose of this paper is to investigate the well-posedness of the inverse variational inequality. We establish some characterizations of its well-posedness. We prove that under suitable conditions, the well-posedness of an inverse variational inequality is equivalent to the existence and uniqueness of its solution. Finally, we show that the well-posedness of an inverse variational inequality is equivalent to the well-posedness of an enlarged classical variational inequality.

Keywords: Inverse variational inequality, variational inequality, well-posedness, metric characterization.

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