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Inexact implicit methods for monotone general variational inequalities. (English)

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Summary: Solving a variational inequality problem is equivalent to finding a solution of a system of non-smooth equations. Recently, we proposed an implicit method, which solves monotone variational inequality problems via solving a series of systems of nonlinear smooth (whenever the operator is smooth) equations. It can exploit the facilities of the classical Newton-like methods for smooth equations. In this paper, we extend the method to solve a class of general variational inequality problems

$$Q(u^*) \in \Omega, \quad (v - Q(u^*))^T F(u^*) \geq 0, \quad \forall v \in \Omega.$$

Moreover, we improve the implicit method to allow inexact solutions of the systems of nonlinear equations at each iteration. The method is shown to preserve the same convergence properties as the original implicit method.

MSC:

49J40 Variational inequalities

90C30 Nonlinear programming

90C33 Complementarity and equilibrium problems and variational inequalities (finite dimensions) (aspects of mathematical programming)

47J20 Variational and other types of inequalities involving nonlinear operators (general)

Cited in **100** Documents

Keywords:

variational inequalities; non-smooth equations; implicit method; systems of nonlinear equations

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