

# Efficiently implementable iterative methods for linear elliptic variational inequalities with constraints on the gradient of solution

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## Abstract

© 2015, Allerton Press, Inc. We construct and investigate a new iterative solution method for a finite-dimensional constrained saddle point problem. The results are applied to prove the convergence of different iterative methods for mesh approximations of variational inequalities with constraints on the gradient of solution. In particular, we prove the convergence of two-stage iterative methods. The main advantage of the proposed methods is the simplicity of their implementation. The numerical testing demonstrates high convergence rate of the methods.

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## Keywords

constrained saddle point problem, finite difference approximation, iterative methods, variational inequality