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**First order optimality and multigrid solvers for a class of  
elliptic mathematical programs with complementarity  
constraints**

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An optimal control problem governed by an elliptic variational inequality of the first kind and bilateral control constraints is studied. A smooth penalization technique for the variational inequality is applied and convergence of stationary points of the subproblems to an E-almost C-stationary point of the limit problem is shown. The subproblems are solved using a full approximation multigrid scheme (FAS) and alternatively a multigrid method of the second kind for which a convergence result is given. An overall algorithmic concept is provided and its performance is discussed by means of examples.