A DUALITY ALGORITHM FOR THE OBSTACLE PROBLEM[*]

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Abstract

We consider the obstacle problem in Sobolev spaces, of order strictly greater then the dimension of the domain. The aim is to propose an algorithm to find the solution of the obstacle problem, based on the solution of the dual approximating problem, which is, in fact, a finite dimensional quadratic minimization problem.

MSC: 65K10, 65K15, 90C59, 49N15.

keywords: obstacle problem, dual problem

1 Introduction

The obstacle problem has been studied by many authors due to its applicability in many fields, such as the study of fluid filtration in porous media, constrained heating, elasto-plasticity, optimal control, and financial mathematics (C. Baiocchi. [3] and G. Duvaut, J.-L. Lions [6]).

We find the obstacle problem in recent works as well, for example in M. Burger, N. Matevosyan, M.T Wolfram, [5], in which an obstacle problem is

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