

A DUAL ANALYSIS OF A CONTACT PROBLEM WITH FRICTION

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1 INTRODUCTION

From the variational formulation of the contact problem with friction one obtains a variational inequality of the second kind containing a non-differentiable term. One of the most used method to remove the difficulties due to the non-differentiable term is the dualisation method.

By choosing appropriate Lagrangeans one can transform the original problem of minimization, into a saddle point problem on a convex set of the form $K \times A$, where K denotes the restraints set and A is the Lagrange's multipliers. This new formulation enable us to use certain known algorithms in order to compute the solution and to avoid the construction of complicated convex sets and to minimize some non-differentiable functionals.

It is important to stress that the Lagrange's multipliers do have mechanical significance and may be directly approximated, in the framework of the dual problem.

The paper contains the following sections :

- existence of Lagrange's multipliers;
- existence and unicity of the saddle point of the Lagrangean