

**On the Weak Solvability and the Optimal Control  
of a Frictional Contact Problem with Normal Compliance**

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**Abstract:** The present talk is devoted to a frictional contact model with normal compliance. The first part of the talk is devoted to the weak solvability of the model. In order to define the weak solutions, two approaches are presented. In a first approach the weak solution is a solution of a quasivariational inequality having as unknown the displacement field. In a second approach a weak solution is a pair consisting of the displacement field and a Lagrange multiplier related to the friction force, the weak solution being a solution of a mixed variational problem with solution-dependent set of Lagrange multipliers. Advantages and disadvantages of both variational formulations as well as some open problems will be presented. Next, a special attention is paid to the boundary optimal control of the model: we discuss an optimal control problem which consists of leading the stress tensor as close as possible to a given target, by acting with a control on a part of the boundary. The existence of at least one optimal control is proved. Furthermore, for a regularized problem an optimality condition is delivered. Based on asymptotic analysis it is shown how the regularized problem, for which we dispose of the optimality condition, allows to approximate a solution of our optimal control problem.