Optimal control of static plasticity

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This talk is concerned with the optimal control of a static model of infinitesimal elastoplasticity with linear kinematic hardening. The goal of this optimal control problem is to adjust the applied loads (volume force and normal stress, respectively) in order to achieve a desired displacement field. Displacement and stress field result from a variational inequality that can equivalently be expressed by a minimization problem for the stress tensor. The overall optimal control problem is therefore a bi-level optimization problem. Problems of this type provide particular non-smooth features and therefore cannot be treated by standard techniques of optimization in Banach spaces. A well known approach is the Yosida regularization of the variational inequality which, in this case, leads to the so-called viscoplastic approximation. We will investigate this approximation technique and the associated convergence analysis.

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