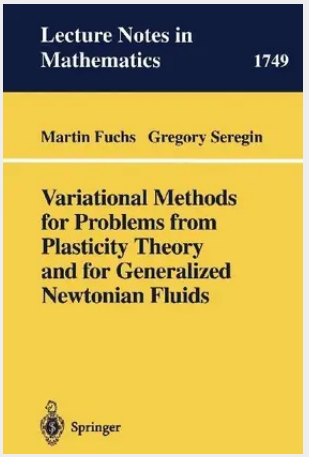
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Variational Methods for Problems from Plasticity Theory and for Generalized Newtonian Fluids

Variational methods are applied to prove the existence of weak solutions for boundary value problems from the deformation theory of plasticity as well as for the slow, steady state flow of generalized Newtonian fluids including the Bingham and Prandtl-Eyring model. For perfect plasticity the role of the stress tensor is emphasized by studying the dual variational problem in appropriate function spaces. The main results describe the analytic properties of weak solutions, e.g. differentiability of velocity fields and continuity of stresses. The monograph addresses researchers and graduate students interested in applications of variational and PDE methods in the mechanics of solids and fluids.

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