Festkolloquium anlässlich des 80. Geburtstags von

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Weierstraß-Institut für Angewandte Analysis und Stochastik
Erhard-Schmidt Hörsaal

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Beginn: 14.00 Uhr

Grußwort der Tschechischen Mathematischen Gesellschaft
Grußwort des Weierstraß-Instituts
Festvortrag „Contact of elasto-plastic bodies"

Contact of elasto-plastic bodies

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Problems of moving visco-elasto-plastic bodies in contact with an elasto-plastic obstacle are usually stated in terms of rate independent variational inequalities coupled with PDEs which are solved by suitable approximation techniques. The alternative is to solve the variational inequalities separately and couple the PDEs with the solution operators which are, by virtue of the rate independence, hysteresis operators. In the case of contact problems, hysteresis operators appear both in the elasto-plastic constitutive laws and in the contact boundary condition. Specific analytical properties of the operators make it possible to use conventional methods and prove the existence and uniqueness of solution to the initial-contact-boundary-value problem. In the 1D case, the existence and uniqueness proof can be carried out without the viscosity assumption, and the necessary a priori estimates are derived from the hysteresis second order energy inequality. With viscosity, existence and uniqueness of solutions has been obtained for the full thermodynamic system involving heat exchange between the body and the obstacle as a joint work with A. Petrov.

WIAS

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