Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Mittwoch, 18.06.2014, 15:00 Uhr, Haberstraße 1, Raum 01.025

Variational Integrators for Thermoviscoelastic Coupled Dynamic Systems with Heat Conduction

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Variational integrators are modern time-integration schemes based on a discretization of the underlying variational principle. They thus skip the direct formulation and time discretization of partial differential equations. In mechanics, Hamilton's Principle is approximated by an action sum whose variation should be equal to zero, resulting in discrete Euler-Lagrange Equations or equivalently in discrete Position-Momentum Equations. Variational integrators are, by design, structure preserving (symplecticity) and show excellent long-time behavior.

In order to consider the coupling between mechanical and thermal quantities, Hamilton's principle is extended by using the notion of thermacy as thermal analogue to mechanical displacements. From this variational formulation, variational integrators are constructed.

A thermoviscoelastic double pendulum with heat conduction serves as a model problem.

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