



Einladung zur öffentlichen Defensio

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Thema der Dissertation

Variational models for finite-strain viscoelastic materials

Abstract:

Viscoelasticity is the response of materials like rubber, clay, and various polymers or metals exhibiting both elastic and viscous behavior with respect to the action of external forces. The interplay between the solid-like behavior of elasticity and the fluid-like one of viscosity allows to model several phenomena in continuum mechanics and has originated rich and interesting mathematical theories.

This dissertation aims at investigating recent developments in variational nonlinear models for the evolution of viscoelastic materials at finite-strain and focuses on two main aspects. On the one hand, we study the Poynting-Thomson model at large strains: We show the existence of solutions in a suitable weak sense without resorting to regularizing second-order terms whose physical interpretation is disputed. In addition, we perform rigorous linearization and prove that the classical small-strain model is recovered. On the other hand, we consider the interplay of viscoelastic effects with accretive growth, as occurs in crystallization, swelling of polymer gels, and solidification processes. We show the existence of solutions to the associated coupled problem for different models: We focus on diffused- and sharp-interface two-phase materials and on solids accumulating residual stresses during growth.

Prüfungssenat

Univ.-Prof. Mag. Dr. Andreas Cap
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Zeit und Ort

Mittwoch, 23. Juli 2025, 10:00 Uhr

Online:

<https://univienna.zoom.us/j/69176716169?pwd=uaUa5gVN6Jwsgth4xdxIRJaj80ftBw.1>

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