



Lecture No. 98

Czech Society for Mechanics and Institute of Thermomechanics, CAS

invite you to an **online** research seminar

Slow Dynamics as a Multi-Relaxation Phenomenon

given by

Dr. Jan Kober

Department Impact and Waves in Solids

Institute of Thermomechanics of the Czech Academy of Sciences, Prague

Slow dynamics is a phenomenon associated with elastic hysteresis. When a material is subjected to an external strain excitation, a gradual softening occurs (conditioning phase), once the excitation ends, the material slowly relaxes back to its original state (relaxation phase). This behavior was generally associated with consolidated granular materials such as rocks or concrete, but it was also found in damaged metals, where it manifests in a much more limited extent. The physical origins of slow dynamics are generally attributed to intergrain/interfacial mechanics and friction. As such, it is reasonable to expect, that the relaxation process incorporates some information about the material structure. It was shown, that the relaxation process can be interpreted as a superposition of exponential decays with varying time scales. This multi-relaxation model can be used as a stepping stone to a perhaps more physical model of continuous distribution of decay times. By analyzing relaxation curves of various materials, a link between the distribution peak location and grain size was found. Moreover, when a material damage is on a larger size scale than the microstructure, as is a case for e.g., cracks, bimodal relaxation times distributions were observed. The research of slow dynamics is challenging in various aspects ranging from the experimental management requiring fast and extremely precise velocity measurements, to data post-processing, where a careful parameter optimization is necessary.

The lecture will be held on Thursday, April 29, 2021 at 11:00

Online via ZOOM meeting

with link <https://us02web.zoom.us/j/87237451758>

Meeting ID 872 3745 1758

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Contact persons: Radek Kolman, Hanuš Seiner