Institute of Thermomechanics Seminar
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Lecture No. 74

Czech Society for Mechanics
and Institute of Thermomechanics, CAS

invite you to a lecture and discussion within
the lecture series **Institute of Thermomechanics Seminar**

High Strain-rate Experiments Using Hopkinson Bar: Application on Cellular Metals and Additively Manufactured Auxetic Structures

given by

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Cellular solids, such as metal foams, hybrid foams, 3D printed lattices or additively manufactured auxetic structures are complex lightweight cellular materials with high energy absorption capabilities and possible functionally graded material properties. Thus, mechanical behavior of the materials under the representative loading conditions (i. e., dynamic impact, blast) has to be well understood. In this study, results of several experimental campaigns covering high-strain rate testing of cellular solids using conventional Split Hopkinson Pressure Bar (SHPB) and direct impact Open Hopkinson Pressure Bar (OHPB) are presented. High-speed imaging together with custom digital image correlation (DIC) technique are introduced as vital techniques for a complex experimental analysis of the materials at high strain-rates. Examples covering the evaluation of the displacement and strain fields, different methods for evaluation of Poisson's ratio, and the analysis of the digital image correlation reliability are shown. Comparison of the digital image correlation results with the other methods (e. g. strain-gauges), its limitations and the actual challenges in this field are discussed. Overview of the experiments conducted at low and elevated temperatures observed using high-speed thermal imaging will be provided as well.

The lecture will be held on Wednesday, October 2, 2019 at 10:30 in the building of the Institute of Thermomechanics (lecture room B), Dolejškova 5, 182 00 Prague 8

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