Wednesday July 28 ⏱ 5:00pm – 6:40pm

TS7: MS401:Peridynamics and Its Applications, Chair(s): Erdogan Madenci

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Speakers: 👤 Mas Irfan P. Hidayat   👤 Sai Li   👤 Alfonso Pagani   👤 Eligiusz Postek   👤 Angelo Battistini

📹 Join via Zoom

Session Chair: Erdogan Madenci

Comparison of Meshfree Approach Based on Peridynamic Formulation and Meshless Local B-Spline Collocation Method for Heterogeneous Heat Conduction in Multi-Medium Materials

Presenting Author: Mas Irfan P. Hidayat, Institut Teknologi Sepuluh Nopember

10:00 AM - 10:20 AM

Static Solution of Crack Propagation Problems by Coupled Three-Dimensional Peridynamics and High-Order One-Dimensional Finite Elements

Presenting Author: Alfonso Pagani, Politecnico di Torino

10:20 AM - 10:40 AM

Viscoplastic Material with Shear Bands Effect

Presenting Author: Eligiusz Postek, Institute of Fundamental Technological Research Polish Academy of Sciences

10:40 AM - 11:00 AM

An Approach to the Simulation of the Behaviour of Interfaces between the Layers of TRISO Coated Particle Nuclear Fuel with Peridynamics

Presenting Author: Angelo Battistini, Imperial College London

11:00 AM - 11:20 AM

All times listed are Central Time (CT).

Eligiusz Postek

Institute of Fundamental Technological Research Polish Academy of Sciences

Viscoplastic Material with Shear Bands Effect, *Eligiusz Postek, Zdzis?aw Nowak, Ryszard P?cherski

The paper's subject is the formulation accounting for shear bands in fine-grained metals [1] in terms of peridynamics. The formulation stands for an extension of the viscoplasticity model [2]. Several experimental investigations prove that plastic deformation's main mechanism is developing shear bands in prevailing cases. An influence of the rapid shear banding generation on the cumulated plastic strain field is investigated. The model is valid for finite strains. The primary interest is focused on impact analysis. The numerical models of Taylor bar are shown. A complex structure, such as copper open-cell foam, was presented in [3]. The numerical examples given in [3] are enriched with the newly developed formulation. References 1) Nowak Z, Perzyna P, P?cherski RB (2007) Description of viscoplastic flow accounting for shear banding. Arch Metall Mater 52(2):217-222 2) Foster JT, Silling SA, Chen WW (2010) Viscoplasticity using peridynamics. Int J Numer Meth Eng 81(1):1242-1258 3) Postek E, P?cherski RB, Nowak Z (2019) Peridynamic simulation of crushing process in copper open-cell foam. Arch Metall Mater 64(4):1603-1610

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