

[PO-E2]Poster Session 2

Symposium E

Wed. Oct 31, 2018 5:45 PM - 8:00 PM Poster Hall

[P2-39]Numerical analysis of elasto-plastic behavior of metallic architected materials

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Architected materials is a class of materials that is characteristic by the ordering of constituents in specific geometrical manner. Such geometry provides an extra degree of freedom which allows reaching combinations of properties that cannot be obtained by standard materials. Metallic architected materials are especially attractive because metals are important structural materials and adding internal architecture can enhance their performance in particular applications.

Our study is focused on a numerical investigation of an elasto-plastic response of different planar architected patterns under the basic types of loading (tension-compression, bending). These patterns are made by different combinations of basic metals (for example: Al, Fe, Ti). The objective is to find the relation between the geometry and the resulting properties like stiffness, strength, hardening, ductility, buckling resistance. These relations will help to find optimal internal structure geometries for given materials combinations and loadings. The results from FE simulations will be further used for the production of the real structures using cold spray technology which is very well suited for a fabrication of structures and materials made of metals with different mechanical and physical properties.