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PROCEEDINGS

Material-Structure Integrated Additive Manufacturing of Bio-Inspired Lightweight Metallic Components for Aerospace Applications

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ABSTRACT

In this presentation, we will report our recent research progress and prospect in the fields of laser additive manufacturing (AM) / 3D printing (3DP) of high-performance/multi-functional lightweight metallic components for aerospace applications. The innovative elements of AM including multi-material layout, innovative structural design, tailored printing process, and resultant high performance and multiple functions of components will be addressed. For a tailored printing process, some key scientific issues in AM process control deserve to be studied, including interaction of energy and printed matter, thermodynamic and dynamic behavior of printing, relationship of process parameters, microstructure and properties. For the creation of new structures for AM for aerospace applications, we emphasize the importance of the design and manufacturing of bionic structures learned from nature which may lead to a breakthrough in performance/function of AM components.

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