Special Issue

Numerical Modelling and Quality Assessment of Additively Manufactured Metallic Components

Message from the Guest Editors

Additive Manufacturing (AM) of metallic components is attracting enormous interest from academics and industrials given its potential for advanced applications in different fields such as biomedical implants, aerospace, automotive, energy, etc. One of the limiting factors for the full development of AM applications within industry is the high degree of complexity of the physics inherent to the process. The consolidation of the metallic powder involves phase change, fluid dynamics, thermal balance with very high heating and cooling rates, etc. All these determine fundamental microstructural characteristics of the consolidated material concerning the shape, size, and orientation of the metallographic grains or the size and distribution of pores. Numerical Modelling and quality assessment techniques offer powerful tools to tackle the complex phenomena influencing the dynamics of the microstructure development during the consolidation of the material in metal AM processes. The understanding of these complex relations allows users and researchers on AM systems to determine the mechanisms that connect the process parameters and the microstructure of the consolidated material.

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Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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