14th World Congress on Computational Mechanics (WCCM XIV)
8th European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2020)
July 19- 24, 2020, Paris, France

ADDITIVE MANUFACTURING AND OPTIMIZATION

TRACK 1000: MANUFACTURING AND MATERIALS PROCESSING

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Key words: Additive manufacturing, 3D printing, process simulation, topology optimization, shape optimization.

ABSTRACT

Rapid developments of Additive Manufacturing (AM) technologies generate a need for specialized computational methods to simulate and predict the complex thermomechanical aspects of the manufacturing process, and for dedicated structural optimization approaches to maximally benefit from the unprecedented design complexity that AM provides. These two topics are inherently linked [1], as design optimization without process information is prone to produce unrealistic solutions, and efficient simulation approaches can provide the necessary process input to the optimization process.

This Minisymposium is specifically devoted to this link, *i.e.* to the latest developments in simulation-based design optimization of parts and processes for AM. We aim to bring together researchers from multiple disciplines to exchange ideas on AM process modelling, AM process physics, computational techniques for efficient AM simulation, AM model reduction, AM process optimization, and component shape optimization and topology optimization involving AM-specific considerations.

Suitable topics include, but are not limited to:

- New developments in reducing computation time for process modelling of additive manufacturing
- Multi-material additive manufacturing: process modelling and/or design optimization
- Simplified process modelling for additive manufacturing: model reduction techniques, benchmarking against high-fidelity models
- Topology optimization for additive manufacturing, based on design rules and/or including one or several aspects related to AM process physics
- Experimental validation of optimized parts realized by additive manufacturing

To be suited for this Minisymposium, process simulation studies should include a link to or benefit for design purposes, and design optimization studies should include certain aspects related to the AM process.

REFERENCES

[1] Liu, J. *et al*. (2018). Current and future trends in topology optimization for additive manufacturing. *Structural and Multidisciplinary Optimization*, *57*(6), 2457-2483.