COMPUTATIONAL MODELING OF THE ADDITIVE MANUFACTURING PROCESS AND PROCESS PARAMETER OPTIMIZATION

PÉTER Z. BERKE*

* Université libre de Bruxelles (ULB), Ecole polytechnique de Bruxelles, Building, Architecture and Town Planning (BATir) department
50 av. F.D. Roosevelt, CP194/2, Brussels, B-1050
peter.berke@ulb.be

ABSTRACT

The chain of steps in additive manufacturing that usually involve melting, extrusion, deposition and solidification is complex due to the governing physics and intricate interactions between different physical phenomena. This complexity explains the large number of process and material parameters that determine the quality and mechanical performance of the printed part. A complete understanding of the manufacturing process and the optimal choice of processing parameters are active research topics of clear scientific and industrial interest today.

This session focuses on contributions to the state of the art of the computational modeling of the additive manufacturing process, without limitation of the printed material (plain and reinforced polymer filaments, concrete, etc.) and on numerical efforts that aim at the optimization of process parameters and printing trajectories. Contributions on framework/method development as well as more application-driven efforts are also welcome. Treating these two approaches with generally different foci in the same session specifically aims at catalyzing the discussion and interaction between researchers active on these research tracks.