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Simulation-based optimisation of additive manufacturing processes

November 2017

Research directions

Part Design

Pre-Processing

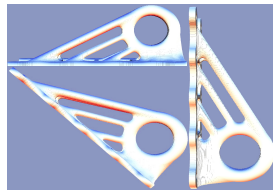
AM process

Post treatment

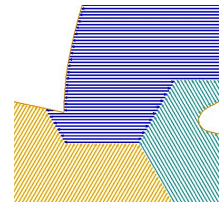
Topology optimization



Part orientation

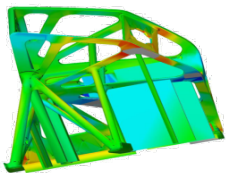


Scan Strategies

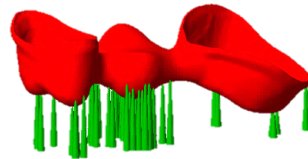


HIP
(in progress)

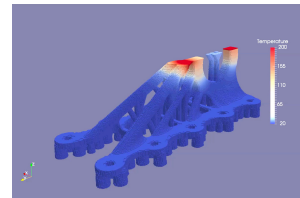
Residual stress & distortion



Support Structures

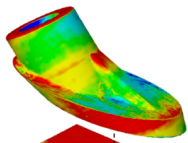


Thermal management



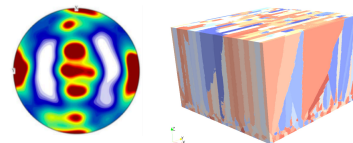
Milling
(in progress)

Compensation of distortion



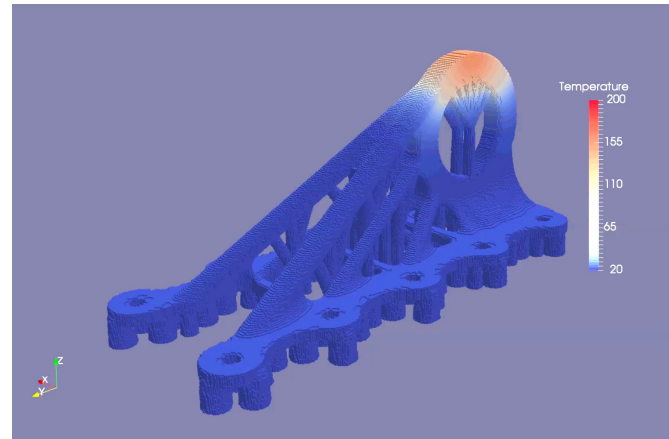
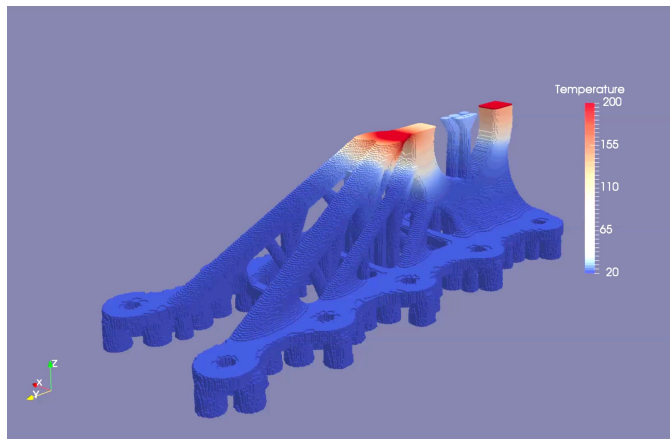
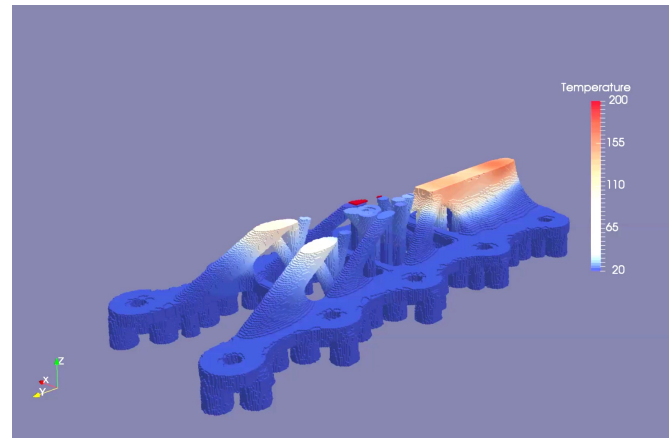
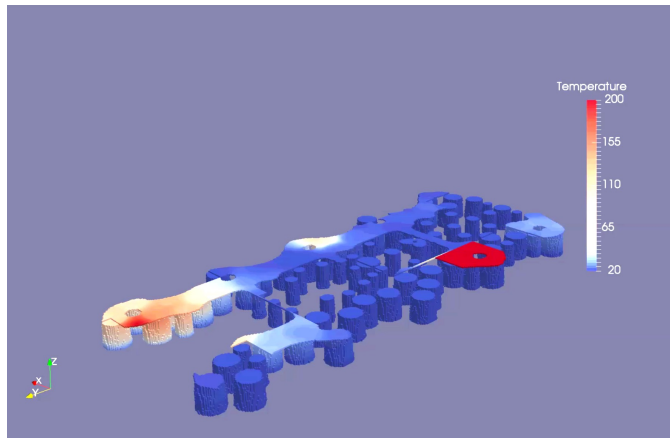
Nesting of parts
(in progress)

Microstructure & properties



Special heat treatment
(in progress)

Thermal process hidden under powder



Research directions

Part Design

Pre-Processing

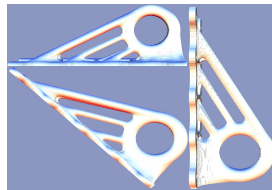
AM process

Post treatment

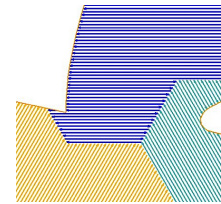
Topology optimization



Part orientation

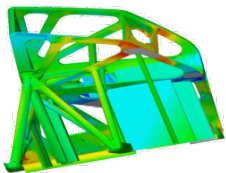


Scan Strategies

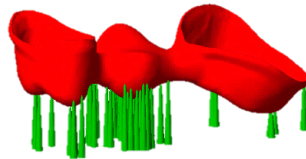


HIP
(in progress)

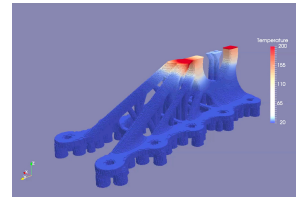
Residual stress & distortion



Support Structures

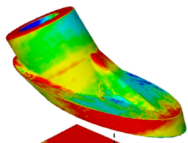


Thermal management



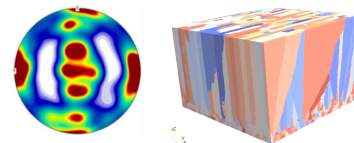
Milling
(in progress)

Compensation of distortion



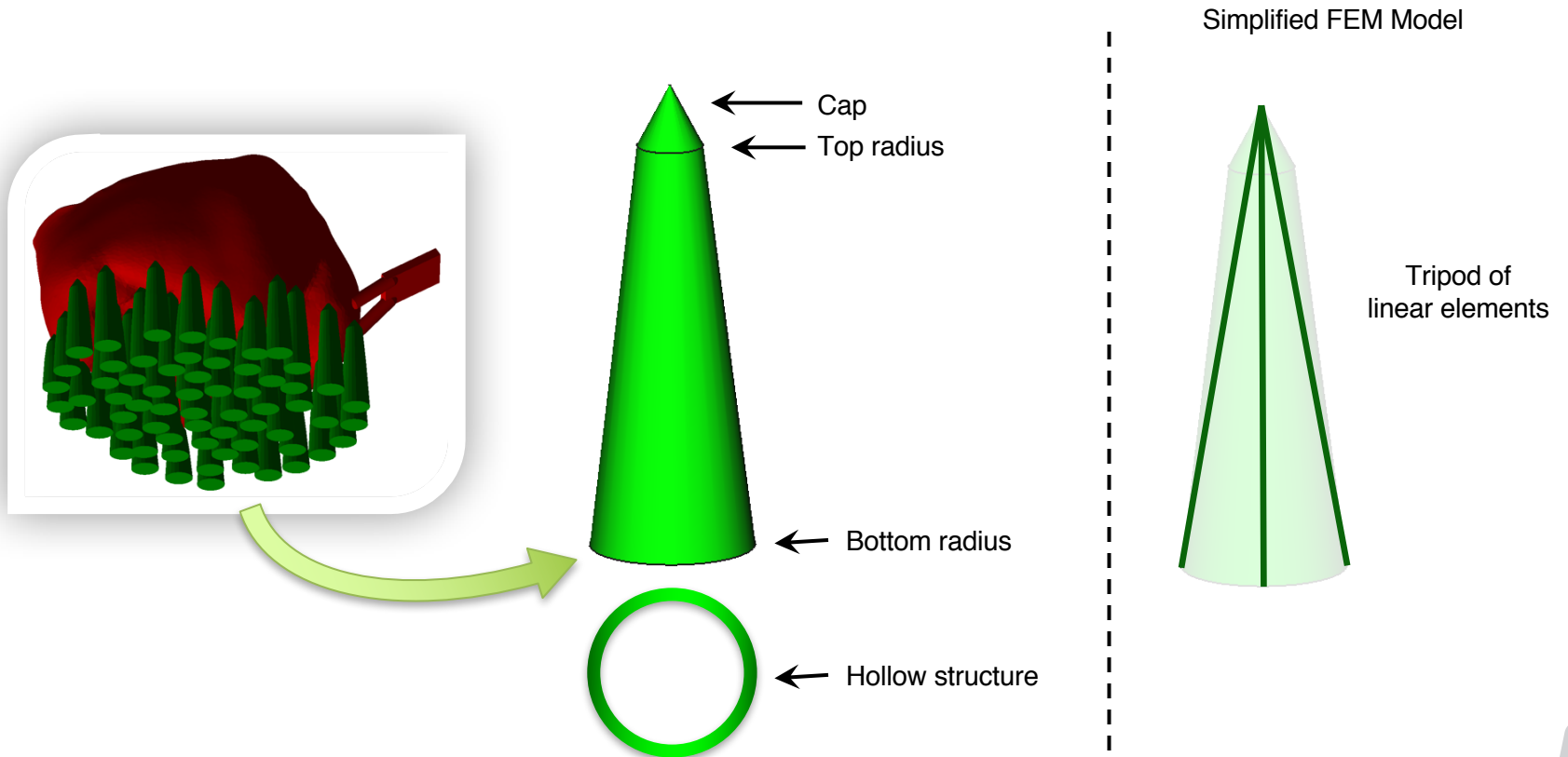
Nesting of parts
(in progress)

Microstructure & properties



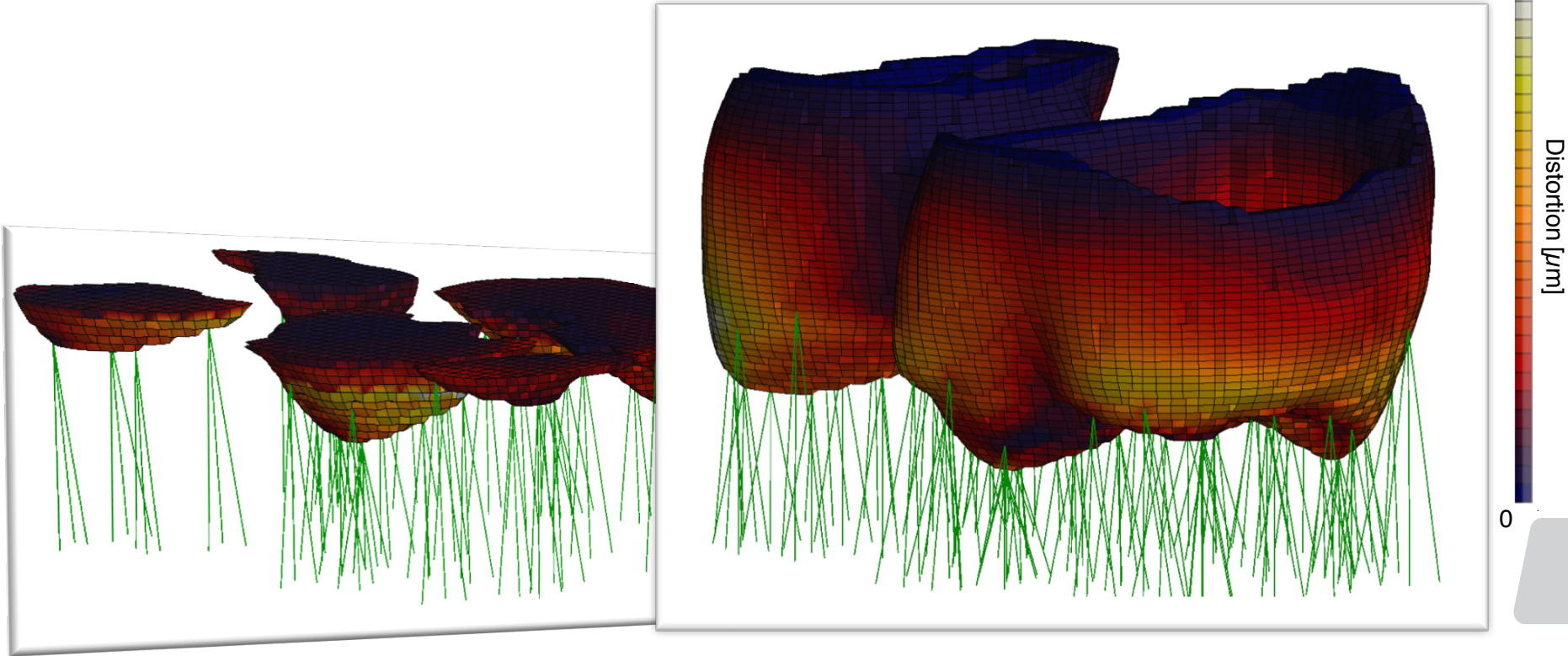
Special heat treatment
(in progress)

Considered Supports



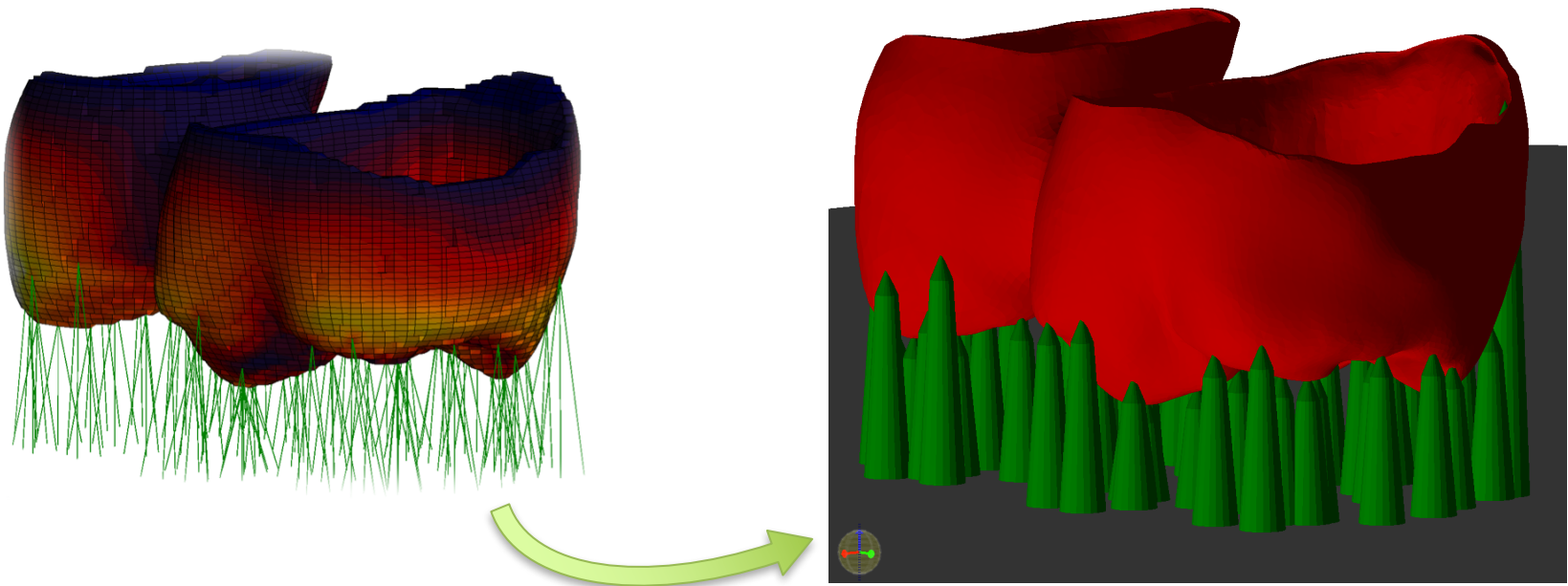
Build-Up Simulation

40



Export of STL Files

- For experimental verification → export as SLT-Files



Many thanks for your attention!

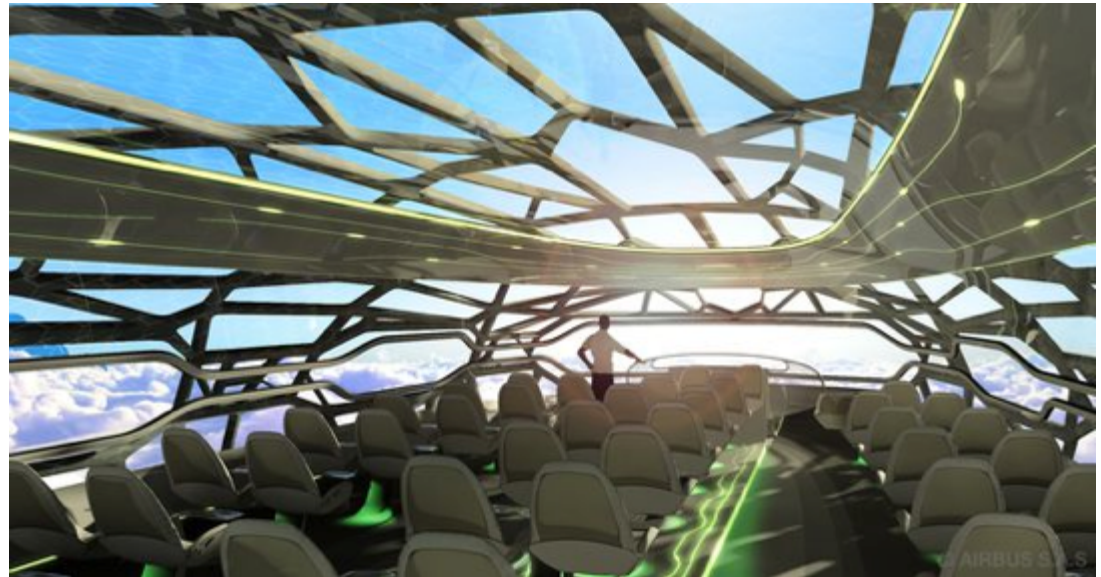
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Vasily Ploshikhin

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Source: Airbus