



european society for precision engineering and nanotechnology

Special Interest Group:

Advancing Precision in Additive Manufacturing

19th-21st September 2023

KU Leuven, Belgium



The next in the series of joint Special Interest Group meetings between euspen and ASPE on Advancing Precision in Additive Manufacturing is crucial to putting additive manufacturing (AM) onto the factory floor. We are seeking papers in the following categories:

- 1. Dimensional accuracy and surface finish in additive manufacturing (AM)**
 - State of the art: What level of precision and technological development is achievable?
 - Functional specifications for form and finish
 - Prediction and modelling of dimensional errors and surface topography
 - Developments in fabricating lattice structures with high integrity
 - Diversity in scale of features: large-scale to micro-/nano-scale
- 2. Design for precision**
 - Design rules and tolerancing for AM
 - Topology optimisation/generative design in the context of AM and achieving precision
 - Novel designs for flexures and kinematic couplings for precision movement
 - Metallurgy and fatigue issues in high-cycle precision applications
 - Design and tolerancing of lattice structures
- 3. Machine precision – process development and control**
 - In-situ process monitoring, e.g. melt zone temperature, powder bed quality
 - In-process measurement of workpiece shape and topography
 - Using artefacts to assess machine performance, round-robin testing
 - Holistic views of the control system, process feedback, correction
 - Machine learning to conquer the complex AM parameter space
 - Machine learning with a focus on precision and uncertainty
- 4. Standards certification and training**
 - Certifying AM equipment capabilities and material properties
 - Industrial demands for ASTM and ISO standards
- 5. Integrating AM into a holistic manufacturing process**
 - Cost-benefit trade-offs of using AM within a complex process chain
 - Engineered partnerships among AM, secondary finishing and/or in-line metrology
 - Kinematic tooling or build-plate engineering
 - Digitalisation of manufacturing
- 6. Metrology**
 - Surface topography measurements on rough as-built surfaces
 - Dimensional metrology of internal features using computed tomography
 - Multi-sensor approaches, data fusion and machine learning
 - Complex form measurement, registration and fitting of point clouds
 - Measurement of 3D lattice strut dimensional accuracy and integrity
 - Characterisation of internal defects and voids
- 7. Simulation**
 - Prediction and accounting for distortion and topography
 - Physical model driven parameter optimisation and defect avoidance
 - Model validation: experimental requirements and datasets

Key dates

21st Apr 2023	Short Abstract Submission Deadline
16th June 2023	Extended Abstract Submission Deadline
7th July 2023	Notification of Presentation Award (Oral/Poster)
7th July 2023	Delegate Registration Opens

Please visit our website for further information

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