Report Out
June 10, 2016

Breakout Out Group:
Process Modeling
Desired AM Capabilities/Technologies

Categories: Process Structure Property, Variability and Uncertainty, Multi-Component Materials, Physics

• Ability to have fully user defined processing parameters
• Predict properties that a designer can actually use (e.g., strength, ductility)
• Models that are consistent with non-equilibrium thermodynamics
• Predict and understand build variability (which will be process dependent), or be able to characterize variability by process
• Fully understand process-structure-property links so as to enable design for performance
• Nonlinear material models for failure mechanism (temperature, constrained properties)
Top-Voted Challenges/Priority Topics

• Lack of non-equilibrium materials and process measurements and models (9)

• Interfacial science (between layers, phases, or multi-materials) (9)

• Agreed model systems for development/validation (e.g., benchmarks) (8)

• Test protocols for testing AM parts (mechanical) (7)

• (Non-technical) Better Structures for multi-disciplinary collaboration (7)