Graduate Student Research Seminar

Spring 2024

Novel Vector Assignment Approach for Inherent Strain Modeling of Laser Powder Bed Fusion Manufacturing

Lucas Morand

Advisor: Dr. Garrett Pataky

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3:00 pm (EST) – 132 Fluor Daniel Building

Abstract

The inherent strain method for laser powder bed fusion additive manufacturing allows for rapidly simulating process-induced distortion while still retaining the influence of thermo-mechanical physics. However, previous implementation of a single vector taken from a global average did not fully capture the known AM process physics. This study included the effects of the rapidly cooled tensile shell and the compressive core from a small-scale model to apply to the part-scale model with multiple vectors of eigenstrains. This novel vector assignment approach better captures the process physics in order to improve additive manufacturing simulation accuracy without significantly increasing computational cost.

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