

Peer Review

Review of: "Data-Driven, Parameterized Reduced-order Models for Predicting Distortion in Metal 3D Printing"

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1. Page 2, line 6: The amount of distortion should also depend on layer height, hatch spacing, laser spot diameter, etc. Authors should include more references and make the introduction more comprehensive.
2. Details of the ANSYS Additive Suite should be provided. Is it using FEM, FVM, or something else?
3. Figure 1's tensor dimension is vague. The displacement/distortion dataset is defined as $N_\mu \times N_h \times N_t$, but in the figure, it is presented as $N_\mu \times N_t \times N_h$. Is the length along the N_t direction equal to 80, as shown in the figure for Dwell time?
4. Not sure why the equations are not numbered.
5. Properties of 'r' are not described in the first equation.
6. What is μ ?
7. Clarification regarding training, validation, and test on dt (dwell times) should be clearly provided early on. What is the reason
8. Citation is required for the industry standard within ± 0.1 mm, as mentioned on the last line of page 6.
9. How many CPUs are used for the POD-GPR runtime of 4 seconds? Should the training time be included as well? At least how long it took to train the model should be mentioned.
10. If the GNN/GCA is suffering from overfitting, maybe figure 4(b) doesn't add much value. In that case, commentary on how to improve the limitation would be more appropriate.

Declarations

Potential competing interests: No potential competing interests to declare.