



Titre: An Efficient Track-Scale Model for Laser Powder Bed Fusion Additive Manufacturing: Part 1- Thermal Model

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Supplementary Material:

As explained in the manuscript, the laser power-speed of 200 W-1000 mm/s was selected for calibration. **Figure I** shows the process of finding the optimum value of C for the HL model with $\tau = 10$ as an example. Both models use identical meshes to compare the nodal temperatures. The HL model simulation was executed with values of C between 0.5 and 2 for the calibration coefficient. The enlarged section of **Figure 9** (except the gray section for the ED model) was selected to compare the results, which includes at least 1008 nodes (the second frame of **Figure I** has 1008 nodes as the gray section has its largest size). Then, each node was compared to find the average error between the ED and HL models. This process was repeated for each frame to find the average error for each frame. Next, the average error of all frames is calculated to evaluate the calibration coefficient. The calibration coefficient that produces the least error is used. Several different τ values were evaluated to confirm the calibration coefficient is correct.

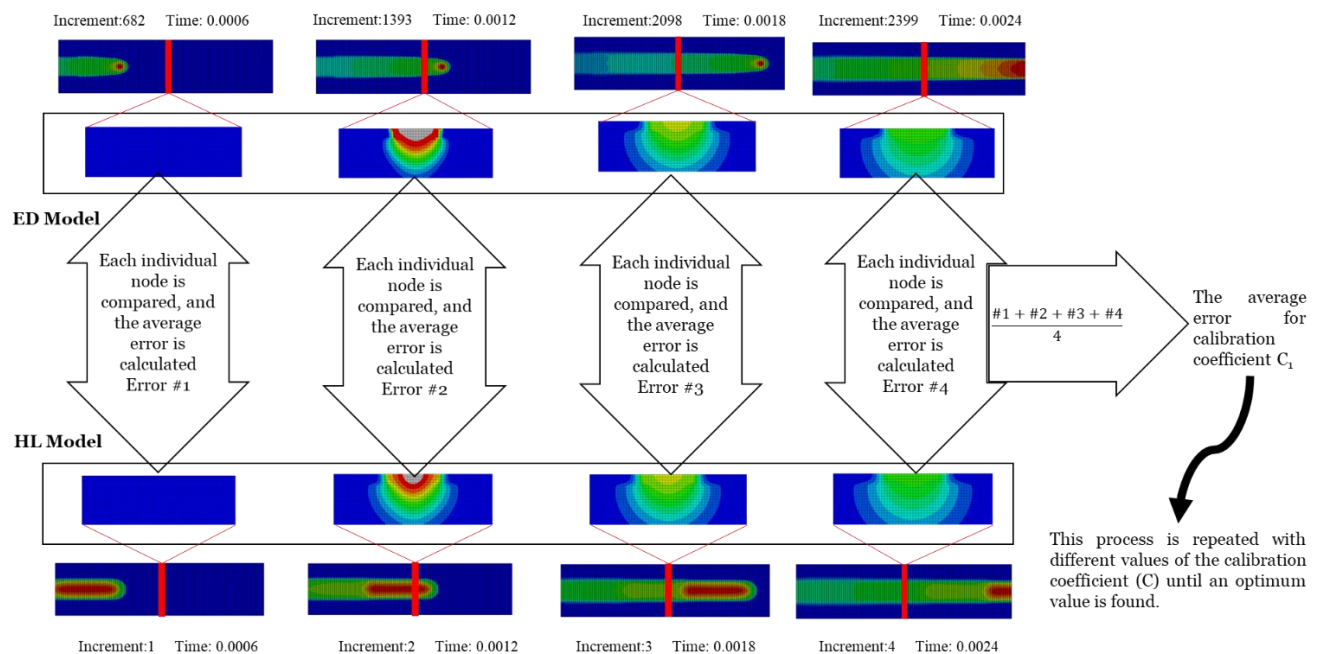


FIGURE I The algorithm to find the calibration coefficient for the HL model with $\tau = 10$.