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Initial alignment and input parameters have a significant impact on the depositions produced by the LENS process. Deposition instability results from an inequality between laser speed, power, and powder feed, as well as a default positive divergence feedback. This instability leads to significant deviations between the intended height of a multi-pass deposit and the actual height. While inequalities persist regardless of feedback conditions, it was suggested that the divergence between intended and actual height can be eliminated by refocusing the laser so that deposition occurs on the opposite side of sharp laser focus (e.g. above the surface of the preceding deposit). Future research will explore the effects of operating on the far side of sharp focus, and further development of analytical models for stable deposition.

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