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Thermal behavior and grain growth orientation during selective laser melting of Ti-6Al-4V alloy

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Abstract

Directional solidification causes a columnar grain microstructure with orientation deviating from building direction to the laser scanning direction which leads to anisotropic mechanical properties of deposited parts in selective laser melting (SLM) additive manufacturing (AM). However, compared to directed energy deposition (DED), the tilt angles between the grain growth orientation and the building direction in SLM are relatively small and hard to investigate due to the high scanning velocity and small facula during processing. This paper investigates the grain growth

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