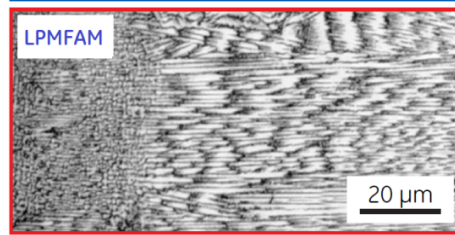
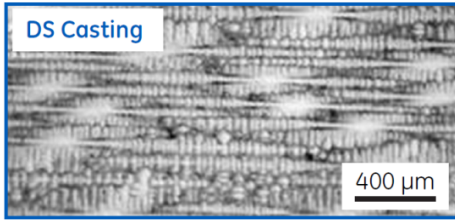


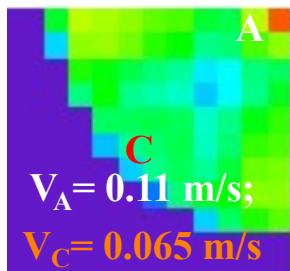
Process Maps for Microstructure in Laser Powder Bed Fusion Additive Manufacturing (LPBFAM) Process

Need Provide experimentally validated process maps to achieve design performance through microstructure control for the LPBFAM

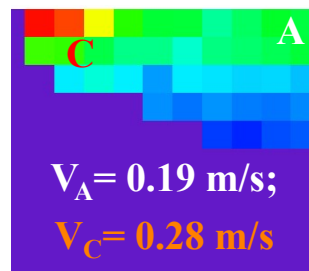


Microstructure for different solidification conditions

Phase-change	Fluid Flow	Surface-tension	Evapo-ration	Micro-scale	Direct Micro	CPU cost
Y	Y	-	-	Y	-	1
Y	Y	Y	-	-	-	10
Y	Y	Y	Y	-	-	10
Y	Y	Y	Y	Y	-	20
Y	Y	Y	Y	Y	Y	1000



Spatial distribution of solidification velocity, V , is strongly dependent on fluid flow and surface tension effects.

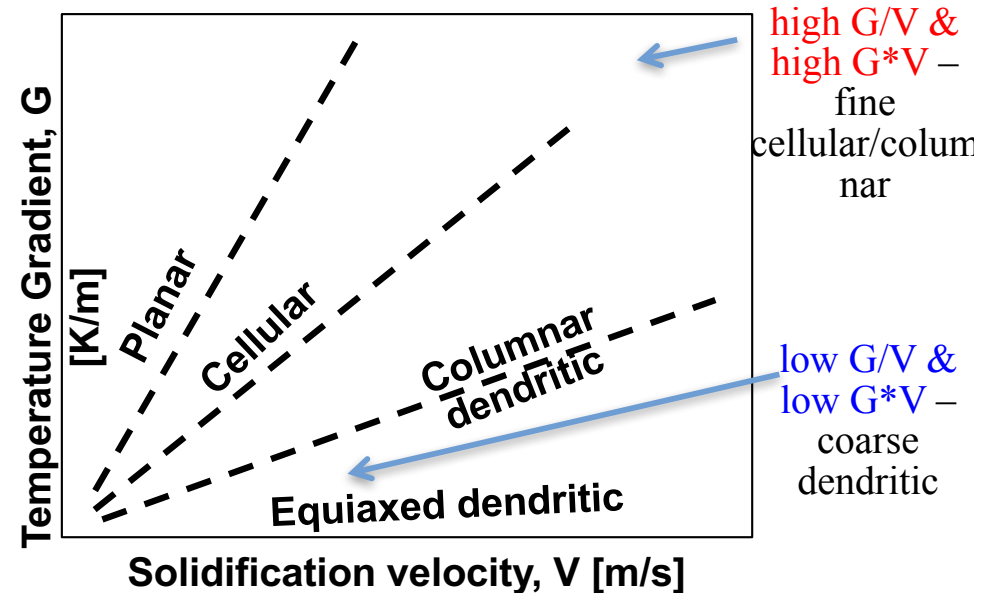


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Benefits The deployment of the new open-source software tool and process maps will:

- Accelerate process certification and new product introduction by reducing design cycles and optimize process development,
- Enable the straightforward adaptation to other related metal AM processes.



Schematic showing solidification microstructure types as function of local G, V .

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