Phase-field simulations of convection-mediated growth competition in weakly-anisotropic solidification microstructures

Kumar Ankit
Materials Science and Engineering, Arizona State University

Background and objectives

- Melt convection is known to modulate dendritic microstructures.
- Are weakly-anisotropic or isotropic seaweed patterns also receptive to convection?
- How does the interplay between surface energy and flow intensity influence the microstructure selection in directionally solidified binary alloys?

Convection-mediated growth competition

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Impact / Future work

- Melt convection and interfacial energy modulate seaweed microstructures during directional solidification.
- Implications in additive-manufacturing processes such as SLM and powder bed fusion, most of which involves non-equilibrium processing, to be explored in future.