

## Ternary Alloy Convection in Mushy Layers: Extended Summary

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We consider solidification and convection in a ternary alloy system. We focus on growth conditions under which the solidification path (liquid line of descent) through the ternary phase diagram gives rise to two distinct mushy layers. A primary mushy layer, which corresponds to solidification along a liquidus surface in the ternary phase diagram, forms above a secondary (or cotectic) mushy layer, which corresponds to solidification along a cotectic line in the ternary phase diagram. These two mushy layers are bounded above by a liquid layer and below by a eutectic solid layer. This double mushy layer geometry provides an interesting setting in which to investigate potential convective effects. In this work we describe a model for the ternary alloy mushy layer system, characteristics of nonconvecting solutions, and an investigation of convective solutions and their stability properties.

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