

## Cell Shapes in Directional Solidification: a Global Study

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This work is devoted to experimentally characterize the whole shape of growth cells in directional solidification, from their tip to their grooves, and in a large domain of control parameter. For this a library of cell shapes is determined and fitted to a class of definite shape functions that involves a minimum of fit parameters. All shape have been finely fitted this way with fit parameters showing meaningful variations with control parameters. This provides the first global characterization of cell shapes, both in the real space and in the control parameter space. Interestingly, no shape transition is found at the sidebranching transition. More generally, this geometrical determination of a whole cell library provides a firm ground for testing or improving theories or simulations of directional growth in the cellular to near dendritic regime.

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