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(schulze@math.utk.edu). *Dendritic Growth Shapes in Bond-Counting Models.*

Dendritic growth of crystals can be simulated using nearest- and next-nearest-neighbor bond-counting models with Kinetic Monte-Carlo methods. In order to compare with analogous continuum models, we derive the surface energy function for a broad class of these models. This surface energy can then be used to construct the model's equilibrium shape, from which one can often anticipate subsequent growth behavior. With these tools in hand, we search for models counting nearest- and next-nearest-neighbor bonds that exhibit twelve- and twenty-four-armed dendrites, which have previously been observed using continuum models. We find that no surface energy function in this class using just two-body nearest- and next-nearest-neighbor interactions yields a twelve-armed dendrite, concluding that longer range interactions would be necessary. More generally, it appears that finite cut-off bond-counting models are not able to reproduce the effects of an arbitrarily specified surface energy functions. (Received September 16, 2015)