

Abstract Submitted
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Nucleation in a long-range repulsive model.¹ KIPTON BARROS, WILLIAM KLEIN, Boston University — We employ a model with long-range repulsive interactions to study nucleation from a fluid to a crystalline phase. The long-range interactions make the metastable fluid phase long lived. From our simulations we find a divergence of the susceptibility at the spinodal, as predicted by mean-field theory. We also observe nucleation events and verify that the nucleating droplets, when they occur, match the numerical saddle point solutions of the free energy functional. In one dimension, where Alexander-McTague type symmetry arguments cannot be satisfied, we find that nucleation does not occur and that the fluid-solid transition is continuous. In two and three dimensions the transition is first order, with nucleating droplets of hexagonal and bcc symmetries.

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