

# Emergence of foams from the breakdown of the phase field crystal model

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The phase field crystal (PFC) model captures the elastic and topological properties of crystals with a single scalar field at small undercooling. At large undercooling, new foam-like behavior emerges. We characterize this foam phase of the PFC equation and propose a modified PFC equation that may be used for the simulation of foam dynamics. This minimal model reproduces von Neumann's rule for two-dimensional dry foams, and Lifshitz-Slyozov coarsening for wet foams. We also measure the coordination number distribution and find that its second moment is larger than previously-reported experimental and theoretical studies of soap froths, a finding that we attribute to the wetness of the foam increasing with time.

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