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Heterogeneity in classical and non-classical nucleation NATALI GULBAHCE, LANL / Clark University, W. KLEIN, Boston University, HARVEY GOULD, Clark University — A crossover from heterogeneous to homogeneous nucleation has been observed experimentally (e.g., in ADP) when the quench depth is increased. To understand this crossover behavior in detail, we have simulated heterogeneous and homogeneous nucleation in nearest-neighbor and long-range Ising models for various quench depths. We find that for a fixed system size the system crosses over from heterogeneous to homogeneous nucleation for increasing quench depth only if the interaction is sufficiently long-range. We determined the survival curve, the fraction of systems that remain in the metastable state after a given time. We find that the survival curves as a function of quench depth have different slopes for heterogeneous and homogeneous nucleation when the interaction is short-range, but have identical slopes within the accuracy of our data for long-range interactions. We conclude that if the extent of the heterogeneity is smaller than the range of interaction, the survival curves will be the same.

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