Phase transition kinetics and critical phenomena of the site dilute Ising model with long range interactions[1] KANG LIU, CHRISTOPHER SERINO, WILLIAM KLEIN, Boston University, HARVEY GOULD, Clark University — We consider the effect of quenched site dilution on the phase transition kinetics and critical phenomena of the Ising model with long range interactions. First, we generalize the Harris criterion to mean-field and near mean-field systems with long range interactions and show that the critical exponents of both the critical point and spinodal do not change regardless of the dimensionality. This is supported by measurements of the isothermal susceptibility near the spinodal line from Monte-Carlo simulations. We also generalize the Coniglio-Klein method by mapping the dilute Ising critical point onto an equivalent site-bond percolation problem. In addition, using the Hubbard-Stratanovich transformation, we are able to write down a coarse-grained field theory for a specific dilution realization and use it to interpret simulations of the defect density dependent local growth of the stable phase after an instantaneous quench.

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