

Hybrid percolation transitions

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Recently hybrid phase transitions including natures of both continuous and discontinuous phase transitions simultaneously have been obtained in diverse complex systems, for example, k -core percolation, cascading failures in interdependent networks, synchronization, etc. However, it is not manifest yet if the critical behavior of hybrid phase transition can be understood within the conventional framework of second-order phase transition. Here, we investigate the critical behaviors of hybrid percolation transitions in the cascading failure model in inter-dependent networks and the restricted Erdos-Renyi model. We find that the critical behaviors of the hybrid percolation transitions contain some unconventional features that cannot be described by the conventional theory of second-order percolation transitions.