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Efficient simulation scheme for studying spin-glass transitions[1]
CHENG-WEI LIU, ANATOLI POLKOVNIKOV, ANDERS W. SANDVIK, Department of Physics, Boston University — We propose and demonstrate an efficient simulation scheme for studying spin-glass transitions. This method is based on the idea of approaching the transition point through a non-equilibrium quench process, formally known as Kibble-Zurek mechanism. Recent studies have shown that there exists dual scaling behavior as a function of quench velocity. This dual scaling behavior allows us to extract transition point, static critical exponents as well as dynamic exponents to good numerical accuracy with an efficient computational effort. We have tested this approach with anti-ferromagnetic Ising model on 3-regular random graphs in terms of both classical and quantum phase transitions and we have obtained good agreement with known results.

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