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Quenches from finite-temperature ultracold matter IAN G. WHITE, KADEN R. A. HAZZARD, Rice University — Although interaction quenches are known to drive interesting dynamics, much prior work has focused on quenches initiated from states that are near the ground state. In contrast, experiments in ultracold matter - from fermionic atoms in optical lattices to dipolar molecules - are often outside this regime, necessitating the study of quenches from higher temperature states. Although in equilibrium, high temperatures are usually associated with trivial, structureless states, driving such states out of equilibrium can lead to rich behavior. For example, we have recently shown that starting from a hot, uncorrelated state of fermions in an optical lattice and evolving it in time leads to substantial intricately-structured correlations between sites - even without interactions during the dynamics. Because including interactions challenges existing theoretical methods (both numerical and analytic) we are developing tools that exploit the nature of the high-temperature initial conditions to calculate these dynamics. We will describe and analyze the accuracy of one such method, a dynamic numerical linked cluster expansion, and its applications to spin systems relevant to cold atoms.

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