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Out of equilibrium spatio-temporal correlations in the Bose-Hubbard model[1] MALCOLM KENNETT, MATTHEW FITZPATRICK, Simon Fraser University — The Bose-Hubbard model (BHM) provides a model system to study quench dynamics across a quantum phase transition. Theoretically, it has proven challenging to study spatio-temporal correlations in the BHM in dimensions higher than one. We use the Schwinger-Keldysh technique and a strong-coupling expansion to develop a two-particle irreducible formalism to allow us to study spatio-temporal correlations in both the superfluid (SF) and Mott-insulating (MI) regimes during a quantum quench for dimensions higher than one. We obtain equations of motion for both the superfluid order parameter and two-point correlation functions and present numerical results for the evolution of two-time correlation functions. We relate our results to experiments on cold atoms in optical lattices.

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