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Schwinger-Keldysh approach to the Bose-Hubbard model with time varying hopping[1] MALCOLM P. KENNETT, Simon Fraser University, DENIS DALIDOVICH, Perimeter Institute; Simon Fraser University — Cold bosonic atoms confined in an optical lattice potential give a realization of the Bose Hubbard model, and it is possible to study the phase transition between a superfluid and a Mott insulator as the depth of the optical lattice is varied. We study the real time dynamics of the Bose Hubbard model at zero and finite temperature in the presence of time-dependent hopping using the Schwinger-Keldysh technique. Using a strong-coupling approach, we determine the effective action in the vicinity of the zero-temperature transition between superfluid and Mott insulating phases. We then study the solutions of the resulting saddle-point dynamical equations as the hopping is varied to sweep across the phase transition from the superfluid to insulating phase.

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