The dynamics of two-component BECs loaded in an optical lattice: truncated Wigner approximation\(^1\) HYUNOO SHIM, THOMAS BERGEMAN, SUNY Stony Brook — For two hyperfine states of ultracold atoms, the interspecies interaction modifies the phase diagram and the superfluid-Mott insulator transition. We study the nonequilibrium dynamics of two hyperfine states of Bose-Einstein condensates in a 1D state-dependent optical lattice with a harmonic trap and we investigate the nonadiabaticity of the phase transition as the lattice potential is modulated. Numerical simulations are performed using the multimode truncated Wigner approximation. An exact ground state is calculated by the split operator imaginary time evolution method for the Gross-Pitaevskii equation. Bogoliubov excitation modes are obtained by an exact diagonalization routine. The propagation of stochastic fields is carried out by the real-time split operator method. We intend to show the behavior of phase coherence, one body density matrix, and number fluctuation.

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