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Ramping through Superfluid-to-Mott transition in the Bose-Hubbard Model BERNHARD WUNSCH, DAVID PEKKER, TAKUYA KITAGAWA, Harvard University, EFSTRATIOS MANOUSAKIS, Florida State University, EUGENE DEMLER, Harvard University — We discuss equilibrium and dynamic properties of cold bosonic atoms in optical lattices which can be described by the Bose-Hubbard Model. Motivated by recent experiments we study local density fluctuations and their correlations both in equilibrium and for a ramp from the superfluid to the Mott regime. We compare mean-field Gutzwiller approach with exact diagonalization studies and analyze the effect of a trapping potential. In order to describe fluctuations and finite temperature we include quadratic fluctuations on top of the mean field.

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