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**Temperature effects when adiabatically ramping up the optical lattice** LODÉ POLLET, ETH Zurich, CORINNA KOLLATH, Université de Genève, KRIS VAN HOUCHE, University of Massachusetts - Amherst, MATTHIAS TROYER, ETH Zurich — When atoms are loaded into an optical lattice, the process of gradually turning on the lattice is almost adiabatic. We calculate the entropy in the single band Bose-Hubbard model for various densities, interaction strengths and temperatures using Quantum Monte Carlo. This allows us to draw equi-entropy lines in order to study the adiabatic heating when going from the gapless superfluid phase to the gapped Mott phase. We present results in one and two dimensions for homogeneous and trapped systems. We find that current experiments remain in the quantum degenerate regime, and our theory can reproduce experimental time-of-flight images.

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