Bosonic Mixtures in one-dimensional optical lattices II ANZI HU,
JQI, UMD, and NIST, Gaithersburg, LUDWIG MATHEY, NIST, Gaithersburg,
and JQI, UMD, IPPEI DANSHITA, JQI, UMD, and Waseda University, Tokyo,
CHARLES CLARK, NIST, Gaithersburg, and JQI, UMD, CARL WILLIAMS, JQI,
UMD, and NIST, Gaithersburg — Using a Time-evolving Block Decimation (TEBD)
approach, we study the quantum phases of bosonic mixtures in one dimension. With
this numerical approach we determine how various phases appear for both finite and
infinite systems. In particular, we relate the different phases of this system to the
microscopic parameters of the underlying Bose-Hubbard model and calculate the
correlation functions that characterize the phases in different parameter regions.
Furthermore, for a finite system, we discuss the effects of a global trap on the state
of the system.

Anzi Hu
JQI, UMD, and NIST, Gaithersburg