Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Dissipation of repulsively bound pairs in the Bose-Hubbard model MATHIAS SCHNEIDER, TU Kaiserslautern, BERND SCHMIDT, MICHAEL FLEISCHHAUER, TU Kaiserslautern — One of the most striking phenomena of the Bose-Hubbard model is the existence of repulsively bound atom pairs (dimers). These objects occur, if the on-site repulsion exceeds the tunneling bandwidth of the single particles by far, so that two atoms on the same site can't get rid of their interaction energy by just tunneling apart. The effective dynamics of dimers is governed by virtual intermediate processes of its constituents and can be described by a Hamiltonian which contains tunneling and nearest neighbor interactions. Additionally, the coupling of the dimers to the system of uncoupled atoms (monomers) leads to decay and/or generation of new dimers. The decay rates of isolated pairs and cluster of pairs is derived and the dynamics of the decay process is studied. In particular, it is shown that the decay of small cluster of pairs leads to temporary entanglement.

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Date submitted: 22 Jan 2010 Electronic form version 1.4