Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

**Multipulse interaction quenched ultracold few-bosonic ensembles in finite optical lattices**[1] SIMEON MISTAKIDIS, JANNIS NEUHAUS-STEINMETZ, PETER SCHMELCHER, Center for Optical Quantum Technologies, University of Hamburg, THEORY GROUP OF FUNDAMENTAL PROCESSES IN QUANTUM PHYSICS TEAM — The correlated non-equilibrium dynamics following a multipulse interaction quench protocol in few-bosonic ensembles confined in finite optical lattices is investigated. The multipulse interaction quench gives rise to the cradle [1,2] and a global breathing mode. These modes are generated during the interaction pulse and persist also after the pulse. The corresponding tunneling dynamics consists of several energy channels accompanying the dynamics. The majority of the tunneling channels persist after the pulse, while only a few occur during the pulse. The induced excitation dynamics is also explored and a strong non-linear dependence on the delayed time of the multipulse protocol is observed. Moreover, the character of the excitation dynamics is also manifested by the periodic population of higher-lying lattice momenta. The above mentioned findings pave the way for future investigations on the direct control of the excitation dynamics. [1] S.I. Mistakidis, L. Cao, and P. Schmelcher, J. Phys. B: At. Mol. and Opt. Phys., 47, 225303 (2014). [2] S.I. Mistakidis, L. Cao, and P. Schmelcher, Phys. Rev. A, 91, 033611 (2015).

[1]Deutsche Forschungsgemeinschaft (DFG) in the framework of the SFB 925 "Light induced dynamics and control of correlated quantum systems"

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Date submitted: 15 Jan 2017 Electronic form version 1.4