Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

One-Dimensional Bose Gases Out of Equilibrium TIM LANGEN, MAXIMILIAN KUHNERT, MICHAEL GRING, BERNHARD RAUER, DAVID ADU SMITH, REMI GEIGER, IGOR MAZETS, Vienna Center for Quantum Science and Technology, Atominstitut, TU Wien, TAKUYA KITAGAWA, EUGENE DEMLER, Harvard-MIT Center for Ultracold Atoms, Department of Physics, Harvard University, JÖRG SCHMIEDMAYER, Vienna Center for Quantum Science and Technology, Atominstitut, TU Wien — We will give an overview of our recent experiments on the quench dynamics and thermalization of isolated quantum systems. In a first experiment we coherently split a one-dimensional Bose gas. The time evolution following this quench leads to the establishment of a quasi-steady prethermalized state which we characterize in detail. Using time-resolved measurements of two-point correlation functions we further show that the strong correlations introduced by the quench decay according to a light-cone-like evolution. In a second series of experiments, we introduce a tunable tunnel coupling between the two gases. This allows us to explore a wide range of quench protocols with time-dependent tunnel couplings.

Tim Langen
Vienna Center for Quantum Science and Technology, Atominstitut, TU Wien

Date submitted: 18 Jan 2013 Electronic form version 1.4