Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Quantum quenches in 1D Bose Gases: Glimmers of Quantum KAM ROBERT KONIK, Brookhaven National Lab, GIUSEPPE BRANDINO, J.-S. CAUX, University of Amsterdam — Using a numerical renormalization group based on exploiting an underlying exactly solvable non-relativistic theory, we study the out-of-equilibrium dynamics of a 1D Bose gas (as described by the Lieb-Liniger model) released from a parabolic trap into a weak cosine potential. The presence of the cosine potential breaks integrability and leads the formerly conserved charges of Lieb-Liniger to be time dependent. We however argue that from these charges we are able to construct approximately conserved quantities despite the presence of the cosine term. How good the time invariance of these quasi-conserved quantities is can be related to the strength of the post-quench cosine potential and the width of this perturbation in Fourier space. This gives then an analog in a quantum example to the classical KAM theorem.

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Date submitted: 15 Nov 2013 Electronic form version 1.4