Abstract Submitted
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Dynamics of a Quasi-1D Bose Condensate in a Double Well Potential Intermediate Between the Tonks-Girardeau (TG) and Gross-Pitaevskii Regimes[1] T. BERGEMAN, SUNY Stony Brook, ZHEDONG ZHANG, SUNY Stonybrook — Dunjko et al. [1] have shown how results of Lieb and Liniger [2] can be used to calculate the ground state of 1D bosons in a harmonic trap, for densities varying between the TG and GP regimes. Berman et al. [3] have shown that dramatic effects in the entropy occur in the transition between these regimes. As we are not aware of predictions for the dynamical behavior of quasi-1D Bose ensembles in double well potentials, we are attempting to adapt approaches of [4] to model oscillations through a barrier of varying height. Simple time-dependent GP equations reveal damping, but what happens at low density is not yet known.

[1] V. Dunjko, V. Lorent, and M. Olshanii, PRL 86, 5413 (2001).
[2] E. Lieb and W. Liniger, PR 130, 1605 (1963).
[3] G. P. Berman et al., PRL 92, 030404 (2004).
[4] R. Pezer and H. Buljan, PRL 98, 240403 (2007).

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