

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Dynamical fermionization of the momentum distribution of a 1D Bose gas JOSHUA WILSON, NEEL MALVANIA, YICHENG ZHANG, WEI XU, LIN XIA, MARCOS RIGOL, DAVID WEISS, The Pennsylvania State University — When a harmonic trap confining a 1D Bose gas in the Tonks-Giardeau limit is suddenly turned off, the initially peaked momentum distribution evolves as it expands in 1D. It ultimately becomes indistinguishable from the momentum distribution of a non-interacting Fermi gas in the original harmonic trap.[1,2] We observe this phenomenon in a bundle of 1D tubes and compare the result to a hard core boson calculation using the experimental trap parameters. We also observe the related dynamics of bosons in a trap after a sudden change of trap depth. [1] In this case, the momentum distribution evolves from bosonic to fermionic, and back, two times per oscillation period. [1]A. Minguzzi, D.M. Gangardt, PRL 94, 240404 (2005) [2]M. Rigol, A. Muramatsu, PRL 94, 240403 (2005)

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Date submitted: 26 Jan 2018

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