

Abstract Submitted  
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**Quench dynamics of a one-dimensional quantum many-body system**<sup>1</sup> SOOSHIN KIM, ALEXANDER LUKIN, MATTHEW RISPOLI, ROBERT SCHITTKO, Harvard Univ, SIMON WEIDINGER, MICHAEL KNAP, Technical University of Munich, ADAM KAUFMAN, ERIC TAI, JULIAN LEONARD, MARKUS GREINER, Harvard Univ — In general, the dynamics of a quantum many-body system represent a computational challenge due to the exponential scaling of the Hilbert space size with system size. Hence, there is great interest in developing easily solvable effective models that nonetheless still capture the essential properties of interest. In this work, we verify the applicability of Luttinger liquid theory for studying quantum quenches in one-dimensional Bose-Hubbard chains by looking at the dynamics of particle number fluctuations. We provide experimental estimates for the Luttinger liquid parameter as a function of interactions in our system.

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