

Abstract Submitted
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The Formation of Phase Structure in the Creation of Soliton Trains¹ JASON NGUYEN, DE LUO, RANDALL HULET, Department of Physics and Astronomy and Rice Center for Quantum Materials, Rice University, Houston, TX 77005 — Matter-wave soliton trains were initially observed following an interaction quench in a condensate of ^7Li atoms². The relative phase between neighboring solitons was inferred to differ by π , giving the appearance of a repulsive interaction between them. The process by which this phase structure is formed is unknown. Starting with a condensate of ^7Li atoms in the $|1, 1\rangle$ state, we study the initial formation of soliton trains by quenching the magnetic field to rapidly vary the interaction from repulsive to attractive in a quasi-1-D system. We study the dynamics of the system shortly after the quench, using multiple in situ images. We previously used this technique to study soliton-soliton collisions³.

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²K.E. Strecker, G.B. Partridge, A. G. Truscott, & R. G. Hulet, *Nature* 417, 150 (2002).

³J. H. V. Nguyen, P. Dyke, D. Luo, B. A. Malomed, & R. G. Hulet, *Nature Physics* 10, 918 (2014).

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