

Abstract Submitted
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Observation of Dynamical Quantum Phase Transition in Antiferromagnetic Spinor Bose-Einstein Condensates HAOXIANG YANG, TIAN TIAN, LIYUAN QIU, HAIYU LIANG, YANBIN YANG, Tsinghua University, CEREN BURCAK DAG, University of Michigan, ANJUN CHU, YONG XU, Tsinghua University, YINGMEI LIU, Oklahoma State University, LUMING DUAN, Tsinghua University — We experimentally study dynamical quantum phase transition (DQPT) in a many-body system with up to tens of thousands particles. We observe non-equilibrium dynamics after a sudden quench of the quadratic Zeeman energy using microwave dressing field. We chose a new observable as indicator of DQPT. The discontinuity of this observable near the transition point indicates the occurrence of DQPT in the system. The experimental result agrees well with theoretical prediction. Our experimental approach mainly overcomes challenges associated with long-time evolution after the quench.

Haoxiang Yang
Tsinghua University

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