

Abstract Submitted  
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**Relaxation in an anisotropic Heisenberg model** IVANA DIMITROVA, NIKLAS JEPSEN, JESSE AMATO-GRILL, Massachusetts Institute of Technology MIT, WEN WEI HO, MIKHAIL LUKIN, EUGENE DEMLER, Harvard University, WOLFGANG KETTERLE, Massachusetts Institute of Technology MIT — Anisotropic spin couplings in the Heisenberg model break rotational symmetry in spin space. We probe this anisotropy by rotating an initial out-of-equilibrium spin pattern. While longitudinal spin modulations only relax by transport, rotating the initial state introduces a new relaxation mechanism. We find intrinsic local dephasing which can be controlled by the anisotropy, and we directly observe the effective magnetic field term in the Hamiltonian, which has its origin in the mapping from the Hubbard model and which has never been observed before.

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