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Quantum quench and non-equilibrium dynamics in a spinor Mott-insulator JARED AUSTIN, ZIHE CHEN, TAO TANG, ZACHARY SHAW, LICHAO ZHAO, YINGMEI LIU, Oklahoma State University-Stillwater — We present an experimental study on the intricate non-equilibrium dynamics of a spinor Bose-Einstein condensate after it is quenched across a superfluid to Mott-insulator transition in a cubic optical lattice. Spin-mixing dynamics consisting of multiple frequencies are observed in time evolutions of the spinor condensate localized in deep lattices. The observed strong dependence of the non-equilibrium dynamics on the lattice potential provides a convenient method to precisely determine the spin-dependent interaction energy. We also confirm that the observed frequencies can be applied to detect atom number distributions of an inhomogeneous system in the Mott-insulator phase.

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