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Spontaneous Symmetry Breaking and Defect Formation in a Quenched Ferromagnetic Spinor Bose-Einstein Condensate LORRAINE SADLER, JAMES HIGBIE, MUKUND VENGALATORRE, SABRINA LESLIE, DAN STAMPER-KURN, University of California, Berkeley — We observe spontaneous symmetry breaking in a spinor Bose condensate of ^{87}Rb that is quenched across a quantum phase transition to a ferromagnetic state. Using high spatial resolution maps of the vector magnetization of the condensate, we directly observe the spontaneous formation of inhomogeneous ferromagnetic regions separated by un-magnetized defects. The growth of these ferromagnetic regions are due to a dynamical instability, which determines their typical size and the time for their formation in accord with our observations.

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