Abstract Submitted
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Quantum quenches in a spinor condensate AUSTEN LAMACRAFT, University of Oxford — We discuss the ordering of a spin-1 condensate when quenched from its paramagnetic phase to its ferromagnetic phase by reducing magnetic field. We first elucidate the nature of the equilibrium quantum phase transition, which has a multicritical point when the magnetization in the direction of the field vanishes. Quenching rapidly through this transition reveals XY ordering either at a specific wavevector, or the 'light-cone' correlations familiar from relativistic theories, depending on the endpoint of the quench. For a quench proceeding at a finite rate the ordering scale is governed by the Kibble-Zurek mechanism. The creation of vortices through growth of the magnetization fluctuations is also discussed. The long time dynamics again depends on the endpoint, conserving the order parameter in zero field, but not at finite field, with differing exponents for the coarsening of magnetic order. The results are discussed in the light of a recent experiment by Sadler *et al.*

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