Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Dynamic vortex unbinding following a quantum quench in bosonic mixtures LUDWIG MATHEY, Joint Quantum Institute, KENNETH GUENTER, JEAN DALIBARD, Laboratoire Kastler Brossel, ENS, ANATOLI POLKOVNIKOV, Boston University, CHARLES CLARK, Joint Quantum Institute — We study the many-body dynamics of a mixture of two hyperfine states of bosonic atoms in 2D, following a pi/2-pulse. Using both a numerical implementation of the Truncated Wigner approximation and an analytical approach, we find that a dynamic phase transition can be triggered, in which the system relaxes from a superfluid to a disordered state via vortex unbinding. This process can be dynamically suppressed, which creates a long-lived metastable supercritical state. We discuss the realization and detection of these effects.

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Date submitted: 19 Nov 2010 Electronic form version 1.4