

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Unusual states of vortex matter in interacting multicomponent Bose-Einstein condensates EGOR BABAEV, University of Massachusetts Amherst, ESKIL DAHL, ASLE SUDBO, NTNU Trondheim — A striking property of a single-component superfluid under rotation, is that a broken symmetry in the order parameter results in a broken translational symmetry, a vortex lattice. If translational symmetry is restored, the phase of the order parameter disorders and the broken symmetry in the order parameter is restored. We show that for interacting mixtures of Bose-condensate (with a dissipationless intercomponent drag), new situations arise. A phase disordered nonsuperfluid component can break translational symmetry in response to rotation due to interaction with a superfluid component. In a different regime instead of a vortex lattice, the system forms a highly disordered tangle which constantly undergoes merger and reconnecting processes involving different types of vortices, with a breakdown of translational symmetry only in a statistical sense.

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Date submitted: 21 Nov 2008

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