

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Unusual states of vortex matter in mixtures of Bose–Einstein Condensates on rotating optical lattices¹ ASLE SUDBO, ESKIL DAHL, NTNU Trondheim, EGOR BABAEV, UMass Amherst and KTH Stockholm — 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 Bose-Condensate mixtures on optical lattices (which may possess a negative dissipationless intercomponent drag), a new situation arises. A phase disordered nonsuperfluid component can break translational symmetry in response to rotation due to interaction with a superfluid component. This state is a modulated vortex liquid which breaks translational symmetry in the direction transverse to the rotation vector.

¹Supported by Research Council of Norway.

Asle Sudbo
Norw. Univ. of Sci & Tech

Date submitted: 23 Nov 2009

Electronic form version 1.4