

Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Normal modes of vortex sheets in a BEC - connection of Tkachenko modes with hydrodynamic excitations SUNGJONG WOO, STEPHEN CHOI, LESLIE BAKSMATY, NICHOLAS BIGELOW, University of Rochester — It is well known that quantized vortices are formed in a rotating Bose-Einstein condensate (BEC). If there are more than one species in a BEC described by separate order parameters, it has been found theoretically that vortex sheets are formed which are different from the ordinary triangular vortex lattice. In our research, the dynamics of vortex sheets has been studied. Differently from the traditional treatment of the vortex dynamics, we start with an idea that the precessional motion of a vortex in a Tkachenko mode can be understood as a local hydrodynamic excitation confined within a vortex. We find that the excitation of a vortex sheet is a connecting route between Tkachenko modes of the vortices and the hydrodynamic modes of the underlying superfluid. Energy spectrum of the Tkachenko modes and hydrodynamic excitations and how they are related through vortex sheets will be discussed.

Sungjong Woo
University of Rochester

Date submitted: 01 Feb 2006

Electronic form version 1.4