A vortex dipole in a trapped 2D Bose condensate WEIBIN LI,
MASUD HAQUE, STAVROS KOMINEAS, MPI-PKS Dresden, Germany — We
study the dynamics and the stationary states of a vortex-antivortex pair in a two-
dimensional Bose condensate in a circular trap. The dynamics of this system turns
out to be surprisingly complicated, reflecting the nonlinearity of the underlying
Gross-Pitaevskii equation. We use a combination of methods — a time-dependent
variational calculation, explicit numerical solutions of the time-dependent and time-
independent Gross-Pitaevskii equations, and an exact solution of the non-interacting
case — to uncover the physics of the vortex dipole system.

Masud Haque
MPI-PKS Dresden, Germany

Date submitted: 26 Nov 2007   Electronic form version 1.4