Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

**Free Surface Waves in Equilibrium with a Vortex** KENNETH MILLER, ALAN ELCRAT, Wichita State University — Computations are given of finite amplitude solitary waves in equilibrium with a point vortex, with or without a submerged obstacle. The method of solution is collocation of Bernoulli's equation at a finite number of points on the free surface coupled with the equations for an equilibrium point vortex. The Kirchhoff-Routh theory for locating an equilibrium point vortex is implemented through numerical conformal mapping between the flow domain and an infinite strip. For a given obstacle, solutions are parametrized with respect to Froude number and vortex strength. For fixed Froude number, solutions can be computed up to a maximum amplitude solution with an angle of 120 degrees on the free surface. As amplitude increases the vortex strength increases to a maximum value, then decreases as the critical solution is approached.

Kenneth Miller
Wichita State University

Date submitted: 02 Aug 2005 Electronic form version 1.4