Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Slow Collisions of Bose-Einstein Condensates[1] BO SUN, MICHAEL S. PINDZOLA, JOHN A. LUDLOW, Auburn University — The dynamics of merging two initially independent Bose-Einstein condensates are studied by deforming a trap potential from a double well into a single well. The process is simulated by a full 3D calculation of the Gross-Pitaevskii equation. For cases in which both condensates begin in excited states, we find quite rich dynamics and complex final states. For example, when both condensates are in initial vortex states, or both are in initial soliton ring states, we find that additional vortices are created by the collision. We present probability density and current maps as a function of collision time in support of future experimental observations.

[1]Work supported by the U.S. National Science Foundation

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Date submitted: 01 Feb 2008 Electronic form version 1.4