

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

From Dark Solitons to Vortex Clusters in Bose-Einstein Condensates PANAYOTIS KEVREKIDIS, University of Massachusetts, Amherst — In this talk, we'll start by considering the experimental, theoretical and numerical dynamical properties of dark solitons in quasi-one-dimensional trapped Bose-Einstein condensates. We will identify the oscillations and interactions of such coherent structures and we will then aim towards generalizing the corresponding notions to quasi-two-dimensional vortex states. In the latter setting, we will use two approaches: one from the linear limit of the underlying system that will permit us to identify the bifurcations of multi-vortex cluster states, while the second in the large density limit will enable our consideration of the vortices as precessing and interacting particles within the condensate. We will corroborate our analytical predictions within these limits and numerical results bridging the limits with experimental observations for the dynamics of few-vortex clusters.

Panayotis Kevrekidis
University of Massachusetts, Amherst

Date submitted: 11 Nov 2011

Electronic form version 1.4