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Dark Soliton Dynamics In Bose-Einstein Condensates PANAYOTIS KEVREKIDIS, UMass, Amherst — In this talk, we will summarize some of the recent experimental activity on the dynamics of dark matter-wave solitons that has been enabled by the very controllable atomic physics setting of Bose-Einstein condensates, focusing especially on some of the most recent developments in quasi-1d settings. We will then illustrate how to connect these findings to numerical computations of one- and multi-soliton solutions and their linearization in appropriately tailored variants of the nonlinear Schrodinger equation which account for the transverse dimensions of the atomic clouds. We will motivate and compare numerical and experimental findings to simple particle-based theoretical models which capture the essential physics of the periodic oscillations observed in this system. Time permitting, we will generalize these considerations to finite-temperature condensates, as well as to multi-dimensional condensates and the precession of vortices within them.

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