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Observing Vortex Dynamics in a Bose-Einstein Condensate[1]
DAVID HALL, DANIEL FREILICH, DYLAN BIANCHI, ADAM KAUFMAN[2], THOMAS LANGIN, Amherst College — Nondestructive imaging techniques make possible the observation of condensate dynamics in the examination of a single atomic sample. This ability is especially useful when initial experimental conditions are difficult or impossible to reproduce, or when random processes play an important role. Established nondestructive techniques are of limited use, however, for observing excitations such as quantized vortices, for which the characteristic length scale is much smaller than the wavelength of the probe light. We describe here our successful experimental implementation of a quasi-nondestructive imaging method that opens a dramatic new window into the dynamics of one, two, and many-vortex condensate configurations.

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