Stroboscopic in situ detection of 2D superfluid dynamics in BECs\textsuperscript{1} JOSEPH LOWNEY, KALI WILSON, BRIAN P. ANDERSON, University of Arizona — Bose-Einstein condensates (BECs) serve as an attractive medium for the study of quantum turbulence. Of particular interest is the ability of a BEC to sustain quantized vortices and solitons, which are central to our understanding of superfluid dynamics. Further studies of such dynamics would be greatly aided by minimally destructive in situ detection of these microscopic density features. We demonstrate, discuss, and compare multiple methods of stroboscopic in situ detection of 2D vortex distributions and superfluid wave phenomena in single component rubidium-87 BECs.

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