

Abstract Submitted  
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**Observation of Faraday Waves in a Bose-Einstein Condensate** PETER ENGELS, COLLIN ATHERTON, Washington State University, Pullman, WA 99164, MARK HOEFER, National Institute of Standards and Technology, Boulder, CO 80305 — Faraday waves in a cigar-shaped Bose-Einstein condensate are created. It is shown that periodically modulating the transverse confinement, and thus the nonlinear interactions in the BEC, excites small amplitude longitudinal oscillations through a parametric resonance. It is also demonstrated that even without the presence of a continuous drive, an initial transverse breathing mode excitation of the condensate leads to spontaneous pattern formation in the longitudinal direction. Finally, the effects of strongly driving the transverse breathing mode with large amplitude are investigated. In this case, impact-oscillator behavior and intriguing nonlinear dynamics, including the gradual emergence of multiple longitudinal modes, are observed.

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