

Abstract Submitted  
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**Laboratory study of spiky potential structures associated with multi-harmonic shear-driven EIC waves**<sup>1</sup> ROBERT MERLINO, University of Iowa, GURU GANGULI, U. S. Naval Research Laboratory, SU-HYUN KIM<sup>2</sup>, University of Iowa — A ubiquitous feature of electric fields observed in the Earth's auroral region is their spiky, repetitive nature, and appearance as either unipolar or bipolar pulses. They have been observed on a number of satellites including S3-3, Polar, Viking, and FAST. These spiky structures have been associated with regions of upward ion flows with transverse shear, and multi-harmonic electrostatic ion cyclotron (EIC) waves. The occurrence of these spiky structures has been attributed to various nonlinear processes, e.g., solitary waves. We will present results of a laboratory experiment performed in a double-ended Q machine, in which spiky potential waveforms were observed in association with coherent multi-harmonic EIC waves in a current-less plasma having a region of parallel ion flow with transverse shear. The spiky waveforms are shown to result from the linear superposition of phase-coherent EIC waves.

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