

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Propagation characteristics of nonlinear dust acoustic waves in inhomogeneous complex plasmas GARIMA ARORA, PINTU BANDYOPADHYAY, M.G HARIPRASAD, ABHIJIT SEN, Institute for Plasma Research — An experimental investigation of the propagation characteristics of nonlinear Dust Acoustic Waves (DAWs) in inhomogeneous complex plasmas is presented. The experiments have been carried out in a Π -shaped dusty plasma experimental (DPEX) device with micron sized Kaolin particles embedded in a DC glow discharge Argon plasma. The dust density inhomogeneity along the axial direction of the device is created by a slight imbalance of the pumping rate and the gas flow rate. Nonlinear-DAWs are excited by compressing the dust fluid during the generation of dust flow and are observed to propagate away from the anode. The effect of the dust density inhomogeneity is investigated on the propagation characteristics of nonlinear Dust Acoustic Waves by analyzing the successive images, which are recorded using a high speed camera. It is found that the wave amplitudes and phase velocities increase with the decrease of dust density along the length of the dust cloud. Our experimental observations for these high amplitude DAWs are found to be consistent with existing fluid theories for the propagation of nonlinear DAWs in inhomogeneous complex plasmas. The details of the experimental procedure and the results will be presented at the conference.

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Date submitted: 03 Jul 2019

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