

Abstract Submitted
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Measurement of the Charge Reduction and Asymmetrical Interaction Force Created by the Ion Wakefield in a Dusty Plasma MUDI CHEN, RAZIEH YOUSEFI, JIE KONG, KE QIAO, JORGE CARMONA-REYES, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — The manner in which the ion wakefield forms has strong implications on the structure, stability and dynamics of a complex plasma. The majority of vertically aligned, ordered dust particle structures observed in a complex plasma result from a combination of the ion wakefield and the external confinement. The ion wakefield is also responsible for other interesting phenomena, such as the reduction in charge seen for a down-stream particle in a vertically aligned dust particle chain and the asymmetrical interaction force between the up-stream and down-stream particles. Unfortunately, few experimental measurements of these phenomena are available. In this experiment, one dimensional (1-D) dust particle structures (i.e., particle chains) are formed in a GEC RF reference cell within a glass box sitting on the powered, lower electrode. The charge reduction on the downstream particle and the asymmetric interaction force are examined using an externally produced DC bias applied to the lower electrode and a diode pumped solid state laser (Coherent VERDI) for perturbation.

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