

Abstract Submitted
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Investigation of plasma particle interactions with variable particle sizes¹ MICHAEL DROPMANN, CASPER - Baylor University / IRS - University of Stuttgart, RENE LAUFER, CASPER - Baylor University, GEORG HERDRICH, CASPER - Baylor University / IRS - University of Stuttgart, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — In dusty plasmas, the dust particles are subjected to many forces of different origins. Both the gas and plasma directly affect the dust particles through electric fields, neutral drag, ion drag and thermophoretic forces, while the particles themselves interact with one another through a screened coulomb potential, which can be influenced by flowing ions. Recently, micron sized particles have been used as probes to analyze the electric fields in the plasma directly. A proper analysis of the resulting data requires a full understanding of the manner in which these forces couple to the dust particles. In most cases each of the forces exhibit unique characteristics, many of which are partially dependent on the particle size. In this study, five different particle sizes are used to investigate the forces resident in the sheath above the lower electrode of a GEC RF reference cell. The particles are tracked using a high-speed camera, yielding two-dimensional force maps allowing the force on the particles to be described as a polynomial series. It will be shown that the data collected can be analyzed to reveal information about the origins of the various forces.

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