

Abstract Submitted
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Measurement of the ion drag force on falling dust particles in a low-pressure plasma¹ VLADIMIR NOSENKO, ROSS FISHER, ROBERT MERLINO, MICHAEL MILLER, University of Iowa — The ion drag force on falling dust particles in a low-pressure discharge was measured experimentally. The plasma was produced in a multidipole hot-filament discharge using argon gas at pressures below 1 mTorr. The plasma density, electron temperature and space potential were measured using a planar Langmuir probe. Typically, the electron density was in the range of 10^{15} - 10^{16} m^{-3} , and the electron temperature in the 2 – 5 eV range. A weak electric field, present along the axis of the plasma, induced a drift motion of the argon ions to velocities several times the ion thermal velocity. Glass micro-balloons (mean diameter 40 or 59 micron), dropped into the plasma using a dust shaker, were deflected by the horizontally-directed drag force produced by the drifting ions. The ion drag force was deduced from measurements of the deflection angles of the particle trajectories which were observed by laser light illumination and recorded by a CCD camera. The measurements will be compared to theoretical models of the ion drag force.

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