

Abstract Submitted
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Single-Camera Stereoscopy Setup to Visualize 3D Dusty Plasma Flows C. A. ROMERO-TALAMAS, T. LEMMA, E. M. BATES, W. J. BIRMIINGHAM, W. F. RIVERA, University of Maryland Baltimore County, MD 21250 — A setup to visualize and track individual particles in multi-layered dusty plasma flows is presented. The setup consists of a single camera with variable frame rate, and a pair of adjustable mirrors that project the same field of view from two different angles to the camera, allowing for three-dimensional tracking of particles. Flows are generated by inclining the plane in which the dust is levitated using a specially designed setup that allows for external motion control without compromising vacuum. Dust illumination is achieved with an optics arrangement that includes a Powell lens that creates a laser fan with adjustable thickness and with approximately constant intensity everywhere. Both the illumination and the stereoscopy setup allow for the camera to be placed at right angles with respect to the levitation plane, in preparation for magnetized dusty plasma experiments [C. A. Romero-Talamas, et al. IEEE T Plasma Sci 44, 535 (2016)] in which there will be no direct optical access to the levitation plane. Image data and analysis of unmagnetized dusty plasma flows acquired with this setup are presented.

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