

Abstract Submitted
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Dust-Tracking Analytical Tools for Low Speed Camera Recording in Plasma Discharges¹ JORGE CARMONA REYES, KE QIAO, MICHAEL COOK, KENNETH ULIBARRI, JEI KONG, LORIN MATTHEWS, TRUELL HYDE, Baylor University — Video data gathered from the PlasmaKristal-4 (PK-4) laboratory on the International Space Station (ISS) is usually recorded at 35 to 70 frames per second. This poses a challenge for tracking individual particle positions, velocities and/or accelerations when the particle motion is such that they cannot be individually resolved at such slow frame rates. However, analysis of this video data is still possible using tools which allow measurement of group phase velocities, particle motion frequencies, particle accelerations, linear and angular direction and overall behavior of the particles. Using CASPER's BU-PK4 ground analog, a map between particle streaking and particle tracking has been assembled which allows correlations between particle streaks and individual particle positions to be determined. Additional analytical tools, useful for development of space-time charts, anisotropic scaling indices and the collection of high-speed data (>50,000 FPS) to determine the presence of ionization waves will also be reviewed. The manner in which these techniques can be used for analysis of PK4 (ISS) data will also be discussed.

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