

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Digital in-line holography of coulomb balls MATTIAS KROLL, DIETMAR BLOCK, OLIVER ARP, ALEXANDER PIEL, IEAP, CAU Kiel, Olshausenstr. 40-60, 24098 Kiel, Germany — Recently, the field of dusty plasmas has a growing interest in three dimensional dust clouds. To observe dynamic processes of micrometer sized particles in a 3D volume with a sufficient time resolution, it is necessary to develop novel diagnostic methods. Beside other methods, digital holography appears to be a promising technology for instantaneous 3D measurement of particle fields. Holograms are directly recorded with a CCD sensor and numerically reconstructed using the Fresnel integral. This does not only eliminate wet chemical processing and mechanical scanning, but also enables the use of complex amplitude information which is inaccessible by optical reconstruction. Thereby, the small depth resolution of digital holography, which is caused by the low pixel resolution of solid state sensors, amends vastly. Further, this technique even allows the observation of dynamical processes. This contribution describes the development and performance test of a digital in-line holography setup and discusses the applicability to coulomb balls.

Mattias Kroll
IEAP, CAU Kiel, Olshausenstr. 40-60, 24098 Kiel, Germany

Date submitted: 22 Jul 2006

Electronic form version 1.4