Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

**Visualization of fluid flow inside the Taylor-cone using micro-particle image velocimetry** DOYOUNG BYUN[1], JIHOON KIM, SI BUI QUANG TRAN, Konkuk University — Nowadays, an electrohydrodynamic jetting technology has received great attention to create micro-scale and nano-scale patterns due to lower fabrication cost and good layer-to-layer registration for flexible electronic and bio-chip devices. However the details of the jetting and bifurcation mechanism have not been fully understood yet. Understanding of flow field inside the Taylor-cone is required to comprehend the mechanism of electrohydrohynamic spraying phenomenon and effects of fluid properties such as viscosity, surface tension, and electrical conductivity. In this paper, we visualized the flow fields and quantitatively measured velocity inside the Taylor-cone using micro-particle image velocimetry. Due to the refraction of light at the cone-shaped liquid meniscus surface, the velocity mapping method is used to correct the image distortion. As electrical conductivity increases, circulation in the cone becomes larger due to strong tangential force at the meniscus and we observed high velocity near the apex of the cone. As liquid viscosity increases, pulsating jet is observed and size of the circulation is decreased.

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Date submitted: 05 Aug 2010 Electronic form version 1.4