Electrospray for Digital Microfabrication

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Abstract

Electrically driven formation of droplets of conducting fluids combined with electrostatic control of droplet trajectory forms the basis of a method that can be used to print liquids with micron resolution. This talk describes basic aspects of this approach and its use in printing a variety of fluids, including suspensions of single walled carbon nanotubes, solutions of conducting polymers, and range of dielectric materials. Simple devices, such as organic transistors and light emitting diodes, demonstrate some of the patterning capabilities. Advantages and disadvantages compared to conventional ink jet printing will be described.

Author Biography

John A. Rogers, obtained BA and BS degrees in chemistry and in physics from the University of Texas, Austin, in 1989. From MIT, he received SM degrees in physics and in chemistry in 1992 and the PhD degree in physical chemistry in 1995. From 1995 to 1997, Rogers was a Junior Fellow in the Harvard University Society of Fellows. During this time he also served as a Director for Active Impulse Systems, a company based on his PhD research that he co-founded in 1995 and which was acquired by a large company in 1998. He joined Bell Laboratories as a Member of Technical Staff in the Condensed Matter Physics Research Department in 1997, and served as Director of this department from 2000-2002. He is currently Founder Professor of Engineering at University of Illinois at Urbana/Champaign, where he pursues his research interests in unconventional methods for micro/nanofabrication, flexible electronics and unusual photonic systems.