

Abstract Submitted  
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**Drop Manipulation by Electrowetting for 3D Printing**<sup>1</sup> JEVON PLOG, University of Illinois Chicago, JENS LOWE, Technische Universitt Darmstadt, Fraunhoferstr, YIZJOU JIANG, YAYUE PAN, ALEXANDER YARIN, University of Illinois Chicago — The experiments in the present work employ electrowetting for the controlled motion on a substrate of drops of different liquid inks used in 3D printing. The electrodes are embedded in dielectric substrates, on which droplet motion is triggered. It is demonstrated that drops of many aqueous polymer solutions and carbon fiber suspensions can be moved on horizontal surfaces. For example, several aqueous polymer solutions, like those of polyethylene oxide and polyacrylamide result in drop motions similar to that of water drops. Also drops of commercial hydrogel, agar-agar, alginate, xanthan gum, and gum Arabic can be moved by electrowetting. Drops of sizes of 200  $\mu$ m and 3 mm can be manipulated and moved by the electric field on different dielectric substrates accurately and repeatedly. This includes horizontal motions, motions on vertical wall, and upside down. Theoretical aspects are discussed as well.

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Jevon Plog  
University of Illinois Chicago

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