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Use of a Novel Fluidic Microplotter in Macroelectronics, Photonics, and Sensors B. LARSON, D. LAGALLY, J. BAIER, SonoPlot LLC, Madison, WI 53714, P. RUGHEIMER, B. TANTO, P. GOPALAN, M. G. LAGALLY, University of Wisconsin-Madison, Madison WI 53706 — Many future applications of microelectronics will focus not on computing but on broader uses in fast flexible electronics, imaging and displays, energy, and environmental and health monitoring. Such uses will require in many cases integration on the mesoscale, and the combination of the fast microelectronics with materials that provide other benefits. One need is the deposition of a wide range of materials from the fluid state. We describe a new fluidic microplotter that enables the deposition of a wide range of materials at the 1 μm and larger scale. The dispensing depends on a novel axial ultrasonic resonance of a fluid micropipette that allows a gentle noncontact deposition of spots, lines, curves, and 3D objects with high precision and very good CV values. We will demonstrate some of the capabilities of the plotter in 1) writing patterns on MEMS membranes, 2) writing a polymer LED, 3) writing parallel lines separated by 1 μm, 4) making bioarrays with very small spots, and 5) writing polymer waveguides, and writing on Si nanomembranes that serve as the basis for very fast flexible electronics. The physical basis for the unique dispensing action in this device, as well as broader features of the plotter will be described. Potential additional applications will be discussed.

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