Abstract Submitted
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Hybrid CMOS/Microfluidic Dielectrophoresis and Magnetic Manipulator Chip[1] DAVID ISSADORE, Harvard School of Engineering and Applied Sciences (SEAS), THOMAS P. HUNT[2], Harvard Physics, KEITH A. BROWN, Harvard SEAS, R.M. WESTERVELT, Harvard SEAS and Physics — We present hybrid CMOS/microfluidic chips that combine the biocompatibility of microfluidics with the programmability of CMOS integrated circuits (ICs). The chips use a two-dimensional array of RF-electrode pixels that use dielectrophoresis (DEP) to simultaneously and independently control the location of many objects, including biological cells and chemical droplets [1]. We highlight our next generation of CMOS/microfluidic chips that combine a two-dimensional array of high voltage (50 V) RF pixels to produce large DEP forces, a microelectromagnetic matrix [2] that can independently trap and move magnetic beads, and integrated temperature sensors. We show the design, fabrication, and testing of the hybrid chips as well as ongoing work to interface and package the chips for robust biological and chemical experiments. [1] T.P. Hunt, D. Issadore, R.M. Westervelt, Lab Chip, 2008, DOI: 10.1039/b710928h. [2] H. Lee, A.M. Purdon and R.M. Westervelt, Appl. Phys. Lett. 85, 1063 (2004).

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