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Liquid “Wires” for Microfluidics NATHAN KELLIS, Brigham Young University, AARON MAZZEO, Massachusetts Institute of Technology, BRIAN MAZZEO, Brigham Young University — We demonstrate liquid “wires” in a simple solution measurement device. This device highlights the possibility of fabricating liquid circuits. These “wires” were formed by filling micro-milled PMMA channels with 5M NaCl solution. Wires were connected to these salt solution channels; the impedance of a test channel filled with solution was measured by an HP 4294A Impedance Analyzer. Deionized water, 2-propanol, and 5M NaCl were measured. Numerical simulations were performed on the channel cross-section to determine the predicted impedance of the device. The simulated results were compared to the experimental data. Graphs of simulations and experiments are presented for the frequency range 1 KHz to 110 MHz. The data show electrode polarization at the electrode-electrolyte interface, as well as parasitic capacitance inherent in the experimental arrangement.

Nathan Kellis
Brigham Young University

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