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**Effect of device geometry on organic electrochemical transistor switching speeds** JACOB FRIEDLEIN, ROBERT MCLEOD, SEAN SHAHEEN, Univ of Colorado - Boulder — It has been demonstrated that redox switching of PEDOT:PSS can be used as the basis for the modulation of channel current in organic electrochemical transistors (OECTs). In this work, we examine the response time of OECTs with different geometries and electrolyte compositions. In particular, we demonstrate which OECT dimensions (thickness, channel length, channel width, and gate-channel distance) have the strongest influence on switching speed and how the switching speed scales with these dimensions. We fabricate our OECTs on glass with evaporated gold electrodes. The PEDOT:PSS is spin-cast to form an approximately 100 nm film. OECT channels are defined by subtractively patterning the PEDOT:PSS film using a microcutter, and the electrolyte is printed from solution using a microcontact printing platform (for solid-state electrolytes) or drop cast (for liquid electrolytes). We characterize these devices with drain voltages $\sim$ 100 mV and gate voltages of $\sim$ 2 V, and we typically obtain drain currents of $\sim$ 50 $\mu$A with ON/OFF ratios up to 100 and switching times of 10 – 1000 s.

Jacob Friedlein
Univ of Colorado - Boulder

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