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Capacitance-voltage characterization of polythiophene-based field-effect transistors BEHRANG HAMADANI, NIST, IAIN MCCULLOCH, Imperial College , MARTIN HEENEY, Queen Mary University of London, DAVID GUNDLACH, NIST, NIST COLLABORATION, IMPERIAL COLLEGE COLLABORATION — We report on frequency-dependent capacitance-voltage characteristics of organic field-effect transistors based on (2,5-bis(3-tetradecylthiophen-2-yl)thieno[3,2-b]thiophene) as the active polymer layer. The gate voltage and frequency behavior of the devices with the polymer spun on treated and untreated oxide gate dielectric are explored. The high quality of the devices (contact and channel properties) allows the use of traditional CV modeling to accurately describe the electrical characteristics of the intrinsic channel. The findings from this study provide new insight into charge trapping and transport in the field-accumulated channel of organic field-effect devices.

Behrang Hamadani
NIST

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