

Abstract Submitted
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Infrared probe of charge dynamics in single crystal rubrene organic field-effect transistors ZHIQIANG LI, University of California, San Diego, VITALY PODZOROV, Rutgers University, NA SAI, University of California, San Diego, MICHAEL MARTIN, Lawrence Berkeley National Laboratory, MICHAEL GERSHENSON, Rutgers University, MASSIMILIANO DI VENTRA, DIMITRI BASOV, University of California, San Diego, UNIVERSITY OF CALIFORNIA, SAN DIEGO COLLABORATION, RUTGERS UNIVERSITY COLLABORATION, LAWRENCE BERKELEY NATIONAL LABORATORY COLLABORATION — We report on infrared (IR) spectroscopy of charge dynamics in organic field-effect transistors based on single crystal rubrene. IR microscopy measurements show uniform charge injection over macroscopic length scales of several millimeters in these devices. IR measurements uncover anisotropic optical conductivities of these transistors in agreement with earlier transport studies. The field-induced electronic excitations in rubrene reveal optical constants with the Drude-like form and low effective masses. I will discuss several new aspects of the charge dynamics in organic molecular crystals uncovered by this work.

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