

Abstract Submitted
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Direct Determination of Mid-Gap States in Molecular and Nanocrystalline Films YINGJIE ZHANG, NOAH BRONSTEIN, Univ of California - Berkeley, DANYLO ZHEREBETSKYY, SARA BARJA, LEONID LICHTENSTEIN, LIN-WANG WANG, Lawrence Berkeley National Lab, PAUL ALIVISATOS, Univ of California - Berkeley, MIQUEL SALMERON, Lawrence Berkeley National Lab — We present a novel approach to directly measure the local electronic density of states (DOS) in the bandgap of monolayer films of organic molecules and semiconductor nanocrystals, by combining Kelvin probe force microscopy (KPFM) and field-effect transistor (FET). By tuning the molecule-dielectric surface chemistry or the nanocrystal surface ligand passivation, the mid-gap DOS can be dramatically changed. The correlation of the local DOS with field-effect transport measurements reveals both the spatial and energetic charge transport pathway.

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