Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Understanding delayed charge injection observed in time-of-flight measurements of hexapentyloxyltriphenylene[1] NATHAN DAWSON, MICHAEL PATRICK, KENNETH SINGER, Case Western Reserve Univ, SANJOY PAUL, BRETT ELLMAN, ALEXANDER SEMYONOV, ROBERT TWIEG, Kent State Univ, PHYSICS, CASE WESTERN RESERVE UNIV. COLLABORATION, PHYSICS, KENT STATE UNIV. COLLABORATION, CHEMISTRY, KENT STATE UNIV. COLLABORATION — Time-of-flight methods are commonly used to measure the mobility in semi-conductors. Features in the transient can be used to identify prominent phenomena in organic semi-conductors such as ion transport, trapping, and recombination. Because of the conditions associated with time-of-flight measurements, low levels of impurities in the bulk are easily observed in time-of-flight measurements that cannot be detected using other techniques. We report on delayed charge injection in hole transport measurements of some purified discogen samples of HAT5. The initial photocurrent appears to follow a stretched-exponential response as a function of time. We model the current response using the continuity equation with a source term at the cathode-material interface. This source term is modeled using a series of trapping states near the interface with the Van de Walle method for describing hydrogen relaxation in amorphous silicon. We give results regarding the accuracy of the model, parameter dependencies on temperature and electric field, and possible mechanisms that influence the degree of these trapping states.

[1]The authors thank the National Science Foundation, grant number OSIE-1243313.

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Date submitted: 01 Feb 2014 Electronic form version 1.4