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Time of Flight Curves For Charge Transport with Spatially Correlated Energetic Disorder DAVID H. DUNLAP, University of New Mexico, PAUL E. PARRIS, Missouri University of Science and Technology — Among the ubiquitous characteristics of charge transport in amorphous semiconductors are the field dependent Poole-Frenkel (PF) mobility and the anomalously broad current-time transients observed in time of flight experiments. The Poole-Frenkel law has been attributed to the fact that the long-range electrostatic interactions in these uncompensated materials are only weakly screened. Consequently the energy landscape over which charges move is smooth and correlated. While the correlations obviously play a role in the general shape of the current-time curves, the relationship between the PF mobility and the shape of the transients has not yet been quantified. In this talk we present results from simulations and analytic calculations for a one-dimensional model. We report on the connection between PF behavior and the universality of the transient shapes seen in both dispersive and non-dispersive regimes.

David H. Dunlap
University of New Mexico

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