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**Sub-threshold charge transport in polymer transistors** SEOHEE KIM, The University of Texas at Austin, TAE-JUN HA, Kwangwoon University, PRASHANT SONAR, Queensland University of Technology, ANANTH DODABALAPUR, The University of Texas at Austin — Research on polymer transistors has taken center stage due to their promise for use in displays, large-area electronics, and sensors. Most transistors with disordered semiconductor active layers such as amorphous silicon and polymers, have a large density of bulk trap states. Sub-threshold conduction in such transistors is very important. In particular, charge transport in the drift-limited sub-threshold regime is important and has not been adequately investigated. In this work, we will present an analysis of sub-threshold charge transport in polymer transistors with active layers based on the diketopyrrolopyrrole (DPP) core. Such transistors possess room temperature field-effect mobilities of over 2 $cm^2/Vs$. We present an analysis of both above threshold and below threshold charge transport and show how the transport mechanisms change with temperature and charge density. We will also discuss a method to correctly calculate the density of trap states by sub-threshold modeling.

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