

Poster Presentations

Determination of the Variation of the Trapped Charge in Organic Thin Film Transistors during Hysteresis

K. M. Awawdeh

Department of physics, Palestine technical university –Kadoorie, Tulkarm-Palestine

Karamawawdeh17@yahoo.com

Abstract

We compare different procedures to extract information about the trapping processes that occur in organic thin film transistors (*OTFTs*) during hysteresis mechanisms. The procedures are based on models that describe the transistor as the combination of an intrinsic transistor and the contact regions. The models are used to fit experimental output characteristics and to extract the current-voltage curves for the intrinsic transistor. We show the importance of eliminating the effect of the contacts, not only from fundamental parameters such as the mobility and the threshold voltage or the drain-terminal voltage, but also from the gate-terminal voltage. Using a previously developed compact model for the *OTFT*, this study aims to complement experimental procedures that also propose to eliminate contact effects. A study of the effects of the contact region on the value of the mobility extracted from different models has been made. Also, we have quantified the effect of eliminating the contact region from the gate- and drain-terminal voltages, and only from the drain-terminal voltage.

A proper extraction of the mobility with a model that incorporates contact effects is essential to obtain good results, even if the terminal voltages are considered instead the intrinsic ones. In this regard, a compact model that describes the output characteristics of the transistor and includes the effect of the contact regions is considered as the best scenario. The worst scenario is when the contact voltage is eliminated partially from the terminal voltages.