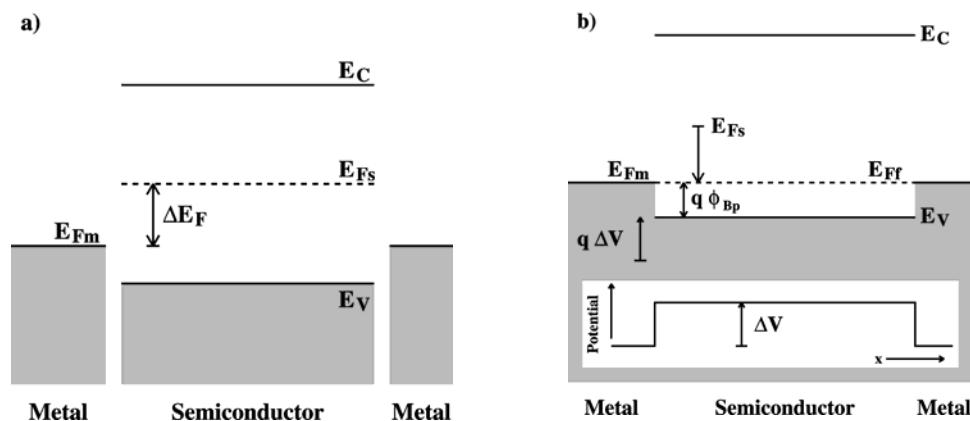


## Metal contacts of thin-film field-effect transistors

*P. Stallinga, H. L. Gomes,  
Universidade do Algarve, Faculdade de Ciências e Tecnologia, Campus de  
Gambelas, 8005-139 Faro, Portugal*

A model is developed for the effects of metal contacts in thin-film field-effect transistors based on treating the active layer of the device as two-dimensional <sup>1</sup>.

Often non-linearities in the device electronic characteristics, namely in the  $I_{ds}$ - $V_{ds}$  curves, are attributed to the contacts. In the current work we show the linearities to have another source and we arrive at an alternative model for the contacts. The results of the model are two fold: i) an added potential to the entire channel and ii) a residual barrier that depends on the gate bias. These predictions are then compared to experimental observations of these two points <sup>2,3</sup>.



*TFT with metal source and drain electrodes before (left) and after (right) contact. The charges flowing into the semi-conductive active layer cause a change of Fermi level and an increased potential. The steady state solution is a homogeneous potential along the entire channel and a remaining small barrier, as indicated.*

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