

Bachelor-Thesis

Derivation of a Compact Model of Metal-Oxide Thin Film Transistor from Measured Data

Metal oxide thin film transistors (TFTs) are low cost large area devices that can be fabricated relatively easily as compared to the Silicon technology. Our 'FflexCom' project partner at the chair of Electronic Devices, University of Wuppertal has fabricated a new Indium Gallium Zinc Oxide TFT for the purpose of RF circuit designing. As an emerging technology, the analog and high frequency modeling of metal-oxide thin film transistors are at a rudimentary stage.

The main objective of this thesis is to develop an accurate and precise SPICE model for our in-house fabricated TFTs to be used for future analog and RF circuit designing. You would perform literature survey and determine the SPICE Level that can fit amorphous IGZO TFT and can support the various Cadence Analysis (such as DC, SP, Noise and HB) necessary for RF Circuit Designing. You would be given the results from the measurement carried out in our laboratory and from the data you have to develop a compact model of the transistor. For that it is essential to have coding skills in python or MATLAB or OCTAVE. You also need to have a basic know-how of Cadence simulation and possibly curve fitting techniques.



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Conditions:

- Coding Skills in Python or MATLAB/OCTAVE
- Knowledge of Field-Effect-Transistors (CMOS technology)
- Basic Cadence Simulation Knowledge

After completion of the thesis, there are good job prospects in the following areas:

- Transistor Modeling Algorithm
- Coding in Python/MATLAB
- Machine Learning (tentative)

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