Masterarbeit / M.Sc. Thesis

Graphene-FET Compact-Model Parameters Fitting to I-V and C-V Measurements

The Background

In 2004, graphene was the first two-dimensional material to be isolated by 2010 Nobel laureates Novoselov and Geim. 10 years later, Graphene remains a hot topic in research across multiple disciplines. Graphene has extraordinary properties that can be exploited to design future nanoelectronic devices. The Graphene-based Nanotechnology (GNT) research group started its research activities in Siegen in 2012, and it is tightly collaborating with other academic and industrial institutions, for example UPC BarcelonaTech (Universitat Politècnica de Catalunya), KTH Royal Institute of Technology in Sweden, PMD Technologies in Siegen or Infineon Technologies AG.

Our Objectives

In advanced societies there is an ever-increasing need for ultra-high-frequency and ultra-small-size wireless transceivers (nano-transceivers) to implement ubiquitous wireless applications, such as wireless nano-sensor networks to drive Industry 4.0. Mature semiconductor technologies are approaching their limits, so that new materials may be needed to deliver higher performance. Graphene, due to its ultra-high mobility, could be the answer. To this end, our goal is to implement and design new integrated circuits based on graphene field effect transistors (GFETs). To achieve that, we need to go through the following stages:

(1) Fabricating GFETs and electrically characterize them
(2) Implementing GFET models and fitting parameters to measurements
(3) Simulating circuits with fitted GFET models
(4) Drawing, fabricating and measuring circuit layouts

Your Responsibilities

(1) Fitting the GFET-model parameters to GFET measurements
(2) Improving GFET-model accuracy
(3) Automating the parameters-fitting routine

Desired Skills

- Written and Spoken English
- Matlab, Verilog-A, Cadence
- Background in electrical engineering, modeling, semiconductors, and transistors
- Full-time dedication
- Highly motivated

Expected Duration

- May-2015 to Oct-2015 (6 Months)

Contact

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