Master thesis/Diploma Thesis

Topic: Compact Model for Nanoscale Ambipolar Transistors

Ambipolar transistors with a parabolic transfer characteristic offer the unique functionality of frequency doubling. In order to perform circuit development for such devices, formula-based descriptions of the device behavior, so-called compact models, are needed. This thesis aims to understand the working principle of the novel ambipolar transistor through measurement carried out in our electrical characterization lab and establish a simple formula-based compact model in Verilog-A or a similar language to enable circuit design in Cadence Virtuoso.

- Literature research about simple compact model variants like EKV
- Run measurements of back-gated ambipolar devices and understand their behavior
- Set-up of a simple formula-based model for the ambipolar device behavior
- Data preparation, analysis, evaluation, and presentation in group meetings

Your qualification:

- Self-organized and conscientious way of working
- High interest in nanoelectronics and circuit designs and self-starter mindset
- Basic understanding of semiconductor devices
- Fluent in either English or German
- Ability to work in an international team environment

The following Skills are a plus:

- Experience with compact modeling, Cadence Virtuoso, or Verilog-A
- Experience with electrical characterization

We offer:

- An inspiring international and open atmosphere
- Individual supervision
- Hands-on contribution to nano-electronic research
- Access to various industry-standard characterization and simulation tools
- Knowledge transfer from experts in the field
- Starting date: as soon as possible

Responsible Professor:

- Prof. Dr.-Ing. Thomas Mikolajick

About us: NaMLab gGmbH is a research organization and associated institute of the Technical University Dresden. NaMLab provides industry oriented and basic research in material science for electronic devices. Based on its key expertise in dielectric materials for semiconductor devices NaMLab focuses on the integration and application of materials applied to reconfigurable and energy efficiency devices. NaMLab‘s approach of placing the device rather than the material system itself into the center of its research activities differentiates it from other world class material research activities in the Dresden area.

For further information please contact:
NaMLab gGmbH
Dr.-Ing. Jens Trommer
Noethnitzer Str. 64a
01187, Dresden, Germany

T.: +49-351-2124990-35
jens.trommer(at)namlab.com
By sending us your application documents, you agree to the use of your personal data for the purpose of the application procedure.