



Master Thesis

Graphene devices for Millimeter-Wave application

Background:

Graphene is a promising 2D material which has unique electrical and mechanical properties. The high electron mobility of graphene promotes it for high frequency applications. Yet, the low cutoff frequency which is due to device fabrication issues limits the usage in such high frequency applications. In addition the poor saturation of the drain current (I_D) leads to low gain circuits. In conjunction with AMO GmbH we have the access to their Graphene technology and we are entitled to design high frequency devices/circuits that use the high electron mobility of Graphene

Tasks: (The tasks can be divided into three main milestones)

1. Literature survey and technology assessment (9 weeks)

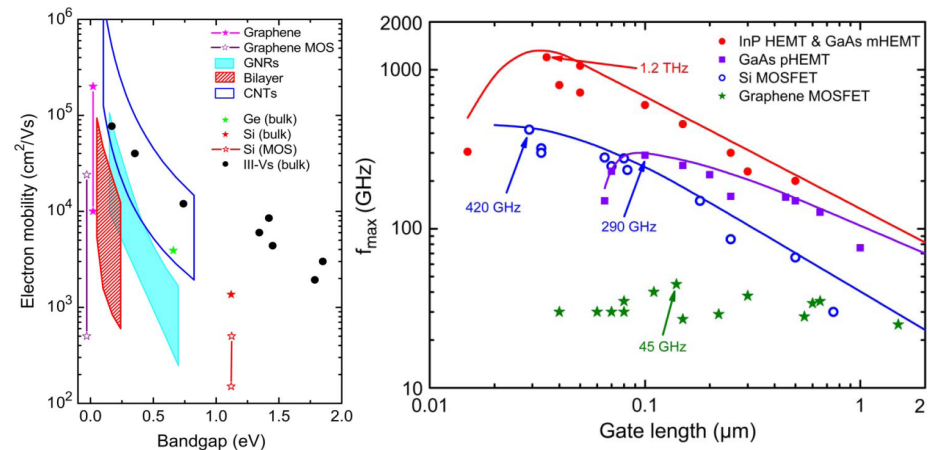
- Make a survey on the state-of-the-art GFETs
- Assess the implementation of other active devices
- Make a fabrication / mask procedure using the available technology
- Make a 1st design review

2. Fabrication and Modeling (7 weeks)

- Fabricate the designed devices
- Characterization and modeling of the new devices
- Make the 2nd design review

3. Verifications and documentation (8 weeks)

- Design circuits using the new devices to validate the process and the model
- Characterize the designed circuit
- Make the final design review
- Documentation (thesis & publication)



Graphene FETs properties and limitations

Further information on this and other topics could be delivered by email, telephone or discussion.

Contact:

Mohamed Elsayed

Address :Kopernikustraße 16, 52074 Aachen, ICT Cubes 5th floor
Room 542

Tel. : 0241-80-24648

E-mail: mohamed.elsayed@hfe.rwth-aache