

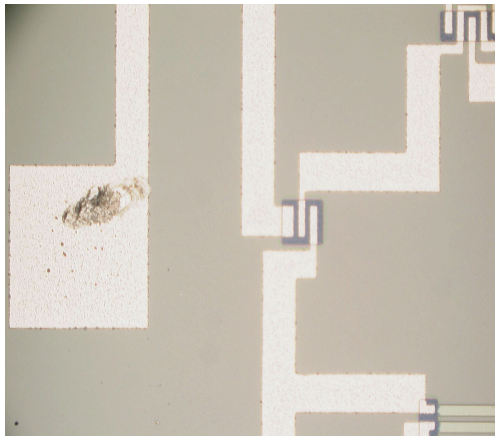
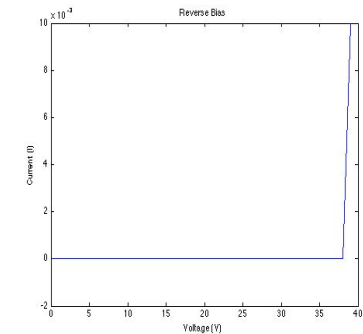
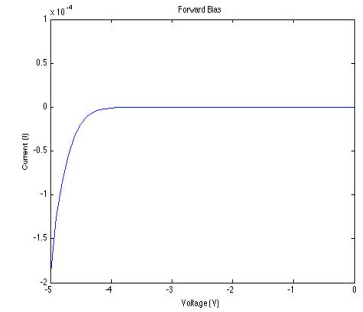
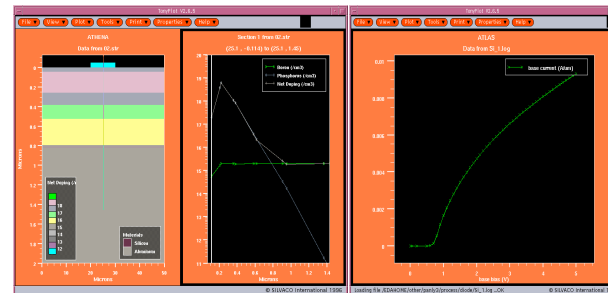
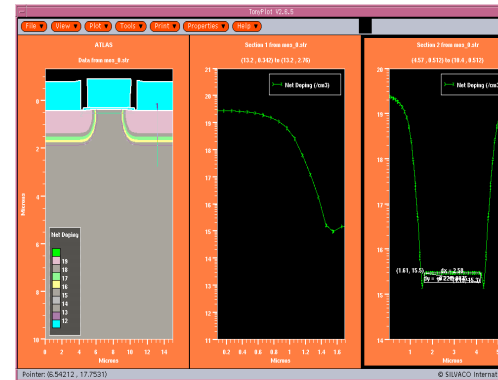
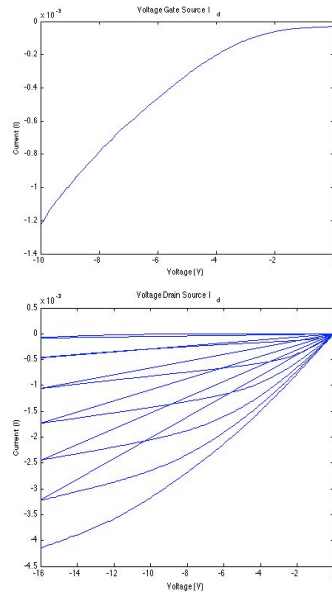
Abstract

In an increasingly fast-changing technological world, engineers and researchers need to learn how to collaborate with people from different backgrounds. Sponsored by the National Science Foundation (NSF) under the International Research Experience for Students (IRES) Program, 4 students had the opportunity to spend 3 weeks in Beijing at the Institute of Microelectronics, Tsinghua University (IMETU.) During this time, we had the opportunity to conjointly work with students from IMETU on design, fabrication and measurement of semiconductor devices.

Introduction

There are a lot of parameters to take into account in transistor design such as the length and width of BJT to control emitter-base and base-collector operation. We learned to design and optimize transistor specifications by CAD, including saturation, cutoff point, and breakdown threshold, etc. Once fabricated, testing is a crucial part before a transistor is mass-produced. The testing either confirms your simulation or provides insights to modify it. Knowledge of design, fabrication and characterization of transistors is essential in order to design effective RF and mixed-signal integrated circuits. During this time, we learned to effectively work in a team with foreign colleagues and share ideas at cultural and academic levels, which shall benefit us in our future career.

Results



Conclusion

- Testing of MOSFET and diodes show the correlation between doping agents and current
- CAD modeling is a very useful tool when designing a semiconductor because you can control your doping and bandgap to fit your required current

Acknowledgments

This project was supported by National Science Foundation IRES. Professor Albert Wang is the PI for the IRES Program. Tsinghua University hosted the IRES2008 team. Jun Wang for all the effort and work done in the background.

Future Work

US-China NSF IRES Program is a program founded for the next 2 years. We encourage students to apply. More info at <http://www.ee.ucr.edu/~ires>

Results show the performance of diode and MOSFET Vgs and Vds. CAD Modeling gave us an overview of the doping effects of a diode and MOSFET