SILICON DEVICE SIMULATION

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A survey of the activities at the Technical University of Vienna will be presented. Efficient simulation tools and accurate modeling are necessary to keep pace with the steadily increasing complexity of IC-fabrication techniques.

Efficient simulation tools and accurate modeling are necessary to keep pace with the steadily increasing complexity of modern IC-fabrication techniques.

Recent developments of the programs ZOMBIE, PROMIS, MINIMOS, BAMBI and ANICA will be discussed and demonstrated by examples.

The one-dimensional and two-dimensional process simulators ZOMBIE and PROMIS permit in an easy way the exchange of physical models and quantities of interest. ZOMBIE has especially been designed for the improvement and development of new models, e.g., phosphorus diffusion, field-enhanced diffusion. Typical applications and results will be presented like the simulation of oxidation enhanced diffusion, various models of gold diffusion in silicon or the interaction between intrinsic point defects *in* silicon and dopants during diffusion.

In MINIMOS, our two-dimensional simulator for planar MOS devices, a new hot-electron transport model has been implemented. It is possible to account for local carrier energy variations, which seems to be a necessity for the presently evolving ULSI devices with submicron feature size.

BAMBI, our universal two-dimensional transient device simulator, is presently tuned to be particularly feasible for trench cells.

ANICA, our two dimensional interconnect capacitance analysis program will be demonstrated to be suitable for tackling the analysis of the parasitic effects regarding capacitances in ULSI structures. As particular example a DRAM cell analysis will be presented.