

Leuven April 10-11th

MODELING AND SIMULATION




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International Technology Roadmap for Semiconductors

Modeling & Simulation TWG: Leuven, Apr. 11th, 2000



Outline

-  **Response to open questions from the last December meeting in Japan**
-  **Update of the 2000 ITRS Roadmap**
-  **New areas to investigate for the 2001 ITRS Roadmap**

Answer to open question from the last JPN TWG meeting on:
Equipment modeling

Q. What's about equipment modeling ?

A. Equipment vendors must supply calibrated equipment models

- ✓ **Physical understanding leads to stable and well qualified equipment**
- ✓ **Equipment models greatly aid process development**
- ✓ **Vendor supplied models are needed to reach cost reduction goals**

Updates for the 2000 Roadmap

- ✓ **Correction of the Process and Device modeling table 87a**
- ✓ **Small modifications of text in Process and Device modeling**
- ✓ **Additional short paragraph on BEOL modeling topics**

2001 issue: SOC

Modeling Simulation TWG needs extra expertise on:

- ✓ **Analog**
- ✓ **RF**
- ✓ **Bipolar**
- ✓ **Noise**

2001 issue: Compact Modeling

Proposal:

[Link to Compact Modeling Council](#)

for circuit element Roadmap on:

- ✓ **MOSFET**
- ✓ **SOI**
- ✓ **BJT**

2001 issue:

How to communicate physical modeling issue to designer ?

Beyond SPICE

Examples:

- ✓ Transmission line
- ✓ S-parameters

Process effects

Examples:

- ✓ lithography induced pattern variation within die
- ✓ Dielectric thickness after CMP

EMC issue

2001 issue: beyond MOS devices

 Exploit quantum effect, don't fear it !

Exploitation of QE may be beneficial

 New computational methods needed

 Evaluation of system performance of beyond MOS technology through Modeling of:

- **FRAM**
- **Electro-optical device for:**
 - ✓ **interconnect**
 - ✓ **switching**