

Minutes of Compact Model Council Meeting

June 30, 2005 Face-to-Face Meeting in Durham, NC

Companies and Universities in Attendance:

Analog Devices, Texas Instruments, AMD, Agilent, NEC Electronics, Hiroshima University, Agere Systems, RF Micro Devices, Broadcom, STARC, Intel, IBM, Philips, Freescale, Pennsylvania State University, Mentor, UC-Berkeley, Cadence, Silvaco, Xpedion, SRC, Synopsys, UMC, Keithley, Jazz Semiconductor, Cypress Semiconductor

1. Membership Review (Joe Watts - IBM)

Joe reported the CMC gained three new members: SRC, Jazz Semiconductor, and Xpedion. This brings the total membership to 30. Cypress Semiconductor and Keithley attended the meeting as potential new members.

2. Treasurers Report (Joe Watts for Robert Lomenick - Intersil)

Membership dues payments appear to be on target. Members were reminded to submit payment for 2005 if they have not already. Reminders notices were sent out in late June. There is likely to be a budget surplus. The CMC will need to decide by year's end what to do with the extra. Last year it was divided among the model support groups.

3. Implementation of Standard Models

Agilent and Synopsys representatives presented status of all standard models in their simulation tools. See their presentation slides for details.

The Cadence and Silvaco representatives reported on PSP and HiSIM implementations. See their presentation slides for details.

Action Item:

All vendor members are asked to update their model status documents linked to the CMC website: http://www.eigroup.org/cmc/cmc_vendor_members/default.htm

4. New Officers

Nominations are due to Joe Watts prior to the 3Q05 meeting. Nominations will also be taken from floor at the 3Q05 meeting. Joe will verify all nominees are willing to serve. The election will take place via electronic ballot before 4Q05 meeting. New officer terms will begin at start of 2006.

5. BSIM3/BSIM4/BSIMSOI (Jane Xi – UC-Berkeley & Keith Green - TI)

BSIM4.4.0, BSIM3.3.0, and a beta BSIMSOI4.0 will all be released at end of July. See Jane's presentation slides for details.

Mark Basel (Mentor) requested better control of parasitic gate, source, and drain resistances in the standard models. The problem stems from trying to coordinate resistances that come from extraction with those already in the models. There is a risk of double counting. See presentation slides for details.

Action Item:

Mark Basel will distribute a proposal on simplified control for parasitic source, drain, and gate resistances and then follow up with a telecon prior to the 3Q05 meeting. This is to include all CMC standard models, but will start with BSIM4.

The CMC made a decision to fold this into the Proximity Effect sub-committee, which may change its name, and will plan to expand its focus to components other than MOSFETs, e.g., resistors and capacitors.

6. HF Noise Measurements Presentation (Dick Klaassen – Philips)

See presentation slides for details.

7. Verilog-a Status Report (Colin McAndrew – Freescale)

See presentation slides for details of status of Verilog-a in various simulators.

Colin reported that derivative generation in ADMS is now programmable to make it readable. SPICE3 support by ADMS is expected by 7/08/2005. (Note, this will be used to generate PSP C code and posted on Penn State University website later in July.) Colin gave a demo of how readable derivatives can be generated from Verilog-a code. C-code generation from MathML (via freeware MathPlayer) is expected in mid-August.

CMC discussed vendors' concerns about getting readable C code derived from Verilog-a rather than 'SPICE' C code. Also discussed whether the deliverable from model developers should be Verilog-a only or Verilog-a and readable C code with derivatives. There does not appear to be an solid long-term support strategy for ADMS. CMC did not reach a resolution on this.

Action Item:

Weidong Liu (Synopsys) and Paul Humphries (ADI) will get examples of HiCUM2.1 simulator implementation inconsistencies to Dave Sheridan (IBM). He will pass these along to Michael Schroter to drive resolution.

8. Website Overview (Keith Green – TI)

Keith gave a brief overview of the CMC's website.

Action Item:

Keith Green will post on CMC website latest press release on results of CMC ballot.

Action Item:

Keith Green will post on CMC website PSP and HiSIM model files for the IBM data.

Action Item:

Keith Green will post on CMC website the next generation MOSFET model candidate overlays from ADI on the CMC website.

9. Mextram Update (Paul Humphries – ADI)

Paul showed comparison plots from TU-Delft that showed there are negligible differences between Verilog-a and Simkit model characteristics. See presentation slides for details.

Action Item:

Doug Weiser (TI) will send details of differences he found in the Mextram Verilog-a and Simkit model results to TU-Delft.

10. HiCUM (Dave Sheridan - IBM)

CMC decided it wants Michael Schroter to prioritize HiCUM 2.1 fixes over HiCUM 2.2 implementation efforts.

Action Item:

David Sheridan will inform Michael of the CMC's decision to prioritize HiCUM 2.1 fixes over HiCUM 2.2 implementation work if any problems are reported.

11. Update on Next Generation MOSFET Model Standard Selection (Joe Watts)

Joe reviewed the selection process. See presentation slides for details.

Professor Tatsuya Ezaki (Hiroshima University) gave an update on HiSIM. See presentation slides for details.

Professor Tatsuya Ezaki reported that additional example test results with HiSIM will be posted along with the July 15 version update.

Action Item:

The HiSIM team is requested to post model test case results as soon as possible.

Professor Gennady Gildenblat (Penn State University) gave an update on PSP. See presentation for details.

Peter Bendix (Xpedion) showed circuit simulations that demonstrated PSP runtime falls between that of BSIM3 and BSIM4 in an Xpedion simulator.

Action Item:

Keith will post Phase-III evaluation results received prior to the 3Q05 meeting on the CMC website.

12. SRC Compact Modeling Activities (Jim Hutchby - SRC)

Jim overviewed SRC Compact modeling research plans.

13. Resistor Model Subcommittee (Colin McAndrew – Freescale)

See presentation slides for details.

Colin expects to release two-terminal resistor model code in July. He requests feedback from members by 3Q05 meeting.

14. Model QA Subcommittee Update (Colin McAndrew)

See presentation slides for details.

15. Proximity Effect Subcommittee Update (Paul Humphries – ADI)

See presentation slides for details.

Action Items:

Mark Basel and Paul Humphries will work with WPE subcommittee to define and document the layout extraction algorithms. They will also turn the “box” ranges into parameters.

Action Item:

Paul Humphries will send out well proximity effect model documentation for subcommittee approval prior to release of BSIM4.5.0. The subcommittee will also make a decision on whether the default well distance for pre-layout use of the model should be changed from 20um.

16. Membership Matters (All)

Nothing to report.

17. Previous Meeting's Carry-Over Action Items:

Action Item:

Keith Green will put a notice on the website that CMC payments to standard model developers are for standardization efforts, not model extraction service.

Action Items:

Colin McAndrew will distribute the CMC_R2 model code by 3/21 for final review by the Resistor Model Subcommittee and EDA vendors. The latter are expected to give feedback on whether and when they could implement this model at the 2Q05 meeting. The CMC will decide whether to adopt this model as a standard at the 2Q05 meeting.

Action Item:

Colin McAndrew will distribute updated CMC_R3 model code by 3/31 for review by the Resistor Model Subcommittee and EDA vendor members.

Action Item:

Paul Humphries will find out whether ADI can provide C code for the CMC_R2 and CMC_R3 resistor models.

18. Next Meeting Planning

The 3Q05 meeting will be held in Santa Barbara following BCTM on October 13 and 14. The Verilog-a tutorial is likely to be held on October 12.

Agenda items will include final evaluation of next generation MOSFET model standard candidates, CMC_R2 ballot, FSA checklist, and nominations for CMC officers.

Meeting Adjourned.

This meeting was conducted in accordance with the EIA Legal Guides and EIA Manual of Organization and Procedure.