Minutes of Compact Model Council Meeting

March 15, 2005 Face-to-Face Meeting in Seattle

Companies and Universities in Attendance:

Analog Devices, Texas Instruments, AMD, Agilent, Atmel, NEC Electronics, Hiroshima University, Toshiba, Agere Systems, RF Micro Devices, Broadcom, STARC, UC-San Diego/TU-Dresden, ST Microelectronics, Intel, IBM, Sandia National Labs, Nassda, Intersil, Renesas Technology, Philips, Freescale, Pennsylvania State University, Mentor, UC-Berkeley, TU-Crete, Infineon, Cadence, Silvaco

1. Membership Review (Joe Watts - IBM)

   Joe reported RFMD and Tower are new members taking the CMC total to 27.

2. Treasurers Report (Robert Lomenick - Intersil)

   Robert reported that six members had paid dues by end of January. All members are reminded to pay by end of June.

   Robert reported the forecasted 2005 budget looks to be on target.

   Robert reported that all of 2004 budget was spent in 2004.

3. Implementation of Standard Models

   See website for EDA members' links and presentations for details:

   Agilent (Maziar Faramand)
   Cadence (Yutao Ma)
   Synopsys (Warren Wong)
   Mentor Graphics - not present but slide shown
   Ivan Pesic (Silvaco) – presentation without slides

4. Mextram Update (Paul Humphries – ADI)

   See website for slide presentation from TU-Delft.

   Members reported the current Simkit is broken. TU-Delft is expected to fix, but has not yet provided a target date.

Action Item
Paul Humphries will ask TU-Delft to provide the CMC a target date for Mextram Simkit correction.

Action Item:
Paul Humphries will inform TU-Delft Mextram team that a representative was expected to attend this meeting and future, first-quarter meetings.

Members are reminded to report Mextram problems via the MUG website helpdesk.

5. HiCUM (Michael Schroter – UC-San Diego/TU-Dresden)

   See presentation slides for details.

   Michael reported a newly hired post-doc student will provide an interface to the user community for questions and problem reports.

   Michael reported that he gets many requests to provide parameter extraction service without payment. Members are reminded that CMC funding does not afford this service.

   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.

   Michael reported he received a request for a reference simulator for harmonic balance. CMC members agreed this was beyond the scope of CMC, however reference HB simulations delivered with standard model updates were suggested to the Quality Assurance Subcommittee.

6. CMC Requirements for Model Code (Dave Sheridan - IBM)

   There was concern about delivery of model equation derivatives from developers to help ensure these are the same in all simulators. There is an open strategic question as to whether developers should deliver C code with derivatives and/or Verilog-a code. CMC did not close on this.

   Action Item:
   Joe Watts will set up a telecon to continue discussion on CMC requirements for model code with EDA vendor members and other member company simulator development staff.

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

   See slides for details.

Action Item:
Joachim Assenmacher (Infineon) will test the BSIM4.5.0 update XGW and NGCON as instance parameters for Igate model and report results to Jane Xi.

Action Item:
UC-Berkeley will release BSIM4.5.0 following implementation and testing of the proximity effect model. If an improved impact ionization current model is available in time it will also go into this version.

Action Item:
Keith Green arrange for TI to assist UC-Berkeley with implementation of its requests for BSIM3 updates.

Action Item:
Joe Watts will arrange a telecon with UC-Berkeley to discuss BSIMSOI model update requests.

Jane suggested targets of June 2005 for release of updates to BSIM3, BSIM4, and BSIMSOI. No final decision was made on this, since it depends on the outcomes of action items above.

8. Verilog-A Update (Colin McAndrew – Freescale)

   See presentation slide on status of Verilog-A implementations in EDA vendor software. (Note, LRM2.2 is the latest version of the standard.)

   Colin showed how correlated noise can be modeled in Verilog-A. See slides for details.

   Action Item:
   Paul Humphries will invite Geoffrey Coram to the 3Q05 meeting to discuss Verilog-A. He will also be asked to give his 2004 BMAS presentation entitled “How to (and How Not to) Write a Compact Model in Verilog-A.”

9. Resistor Model Subcommittee (Colin McAndrew – Freescale)

   See presentation slides for update.

   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.

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

    See presentations slides for details of March 13, 2005 meeting

    Action Item:
    Proximity Effect Subcommittee will produce documentation (spec.) for the proximity model it developed. Paul Humphries will request TSMC draft this. The document needs to include a description of how multi-fingered transistors must be handled in pre-layout and post-layout simulations.

    The document will be reviewed by the subcommittee and, when approved, proposed to the CMC for incorporation in BSIM4 and BSIMSOI. Note a portion of the model will need to be included in layout extraction tools.

11. QA Subcommittee Update (Robert Lomenick – Intersil)

    See presentation slides for details.

    The subcommittee plans to meet monthly via teleconference to develop a specification.

12. Membership Matters (All)

    CMC members recommend EDA vendors provide model developers with their tools to facilitate better model support.

    The suggestion was brought up that CMC take a role in establishing a high-frequency noise measurement standard. The council concluded this was outside its scope. Recommendations were made to take this up at ICMTS or with NIST. Philips will give a presentation on this topic at the 2Q05 meeting.

    A question was brought up on how to provide corner models for noise.

    The request to add self-heating to the BSIM3/4 was brought up again. Again, the council decided not to pursue this due to resource limitations and priorities.

The question of what the CMC's role should be in statistical modeling was raised. The council agreed its role was in steering model developers to provide models that lend themselves to statistical modeling.

13. Next Meeting Planning

2Q05 meeting will be on June 30 in RTP in conjunction with SRC meetings.

Members are encouraged to wear their company badge or a name tag at meetings.

Meeting Adjourned.

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