IBIS Hybrid Summit at IEEE International Symposium on EMC & SIPI 2025 Minutes

Meeting Date: **August 22, 2025**
Meeting Location: **Raleigh, NC USA**

VOTING MEMBERS AND 2025 PARTICIPANTS

Altair	(JuneSang Lee)
AMD	(Bassam Mansour)
Analog Devices	Jermaine Lim-Abroguena, Francis Ian Calubag*, Toni Rose Racelis, Keshav Mehrotra, Vincent Paul Sabillo, Esther Grace Falate
Applied Simulation Technology	(Fred Balistreri)
arm	Kinger Cai*
Aurora System	Raj Raghuram
Broadcom	(Yunong Gan)
Cadence Design Systems	Kyle Lake, Ambrish Varma, Jared James*, Baolong Li*
Ciena	(Stephen Shew)
Cisco Systems	Shadi Ebrahimi*, Quinn Gaumer*, Colin Petherbridge*, [Stephen Scearce], Michael Stetzler*
Dassault Systemes	(Stefan Paret)
GE Healthcare Technologies	(Balaji Sankarshanan)
Google	(Hanfeng Wang), Yifan Ding*,
Huawei Technologies	(Hang (Paul) Yan)
Infineon Technologies AG	[Christian Sporrer], Matthias Knopf, (Kasthuri Rengan Narayanan), Shaowu Huang*
Intel Corporation	Michael Mirmak*, Hsinho Wu
Keysight Technologies	Pegah Alavi, Fangyi Rao, Ming Yan
Marvell	Steven Parker*
MathWorks	Jonathan Adams, Esa Adil, Walter Katz*, Ganesh R. Rathinavel, Kerry Schutz, Tripp Worrell, [Graham Kus]
Micron Technology	(Justin Butterfield)
MST EMC Laboratory	Yifan Ding, Chulsoon Hwang*, Zhiping Yang*, Haran Manoharan*, Lijun Jiang*, Hanyu Zhang*, Jiahuan Huang*
SI-Clarity	Doug Burns
Siemens EDA	Weston Beal, Matthew Leslie, Jessi Lipoth, Zilwan Mahmod, Arpad Muranyi*, Scott Wedge, Todd Westerhoff, Randy Wolff*
Signal Edge Solutions	Benjamin Dannan
STMicroelectronics	(Olivier Bayet), Raushan Kumar, Rahul Kumar, Anil-Kumar Dwivedi, Hemant Kumar Gangwar, Manish Bansal, Pallav Kumar, Pranav Singh, Sachin Yadav
Synopsys	Curtis Clark*, Ted Mido, Diasuke Yamazaki, Jian Yang, Edna Moreno
Synopsys Japan	Satoshi Endo
ZTE Corporation	(Zhongmin Wei), Manisha Bisht
Zuken	(Ralf Brüning), Markus Bücker
Zuken USA	[Lance Wang]

OTHER PARTICIPANTS IN 2025

Alphawave Semi	Todd Bermensolo
Amphenol	Stephen Scearce*
Applied Logix	Dan Chirpich
Applied Materials	Shiva S. Rai*
ATUS	Chite Chen*
Chipletz	Scott Witcher, Stephen Newberry*, Victor Kronberg*
Ciena	Rolynd T. Aquino

DIS TECH	Tao Wang*
FJscaler	Ron Olisar
IBM	Matteo Cocchini*
IIT Jodhpur	Anuj Kumar
KAIST	Seunghun Ryu*, Dongryul Park*, Hyunwoo Kim*, Seonghi Lee*
Kioxia	Masato Kanie
Meta	Ruihua Ding*, Tao Wang*
Microsoft	Doug White*
NCU	Chiu-Chih Chou*,Chien Lee*, Chung-Tzu Hsu*, Chia Cheng Huang*, Fang Jing He*
NTU	Yusheng Li*
Nokia	[Graham Kus], Tyler Swan
NXP Semiconductors	Anurag Singh, Achraf Mellouki
Politecnico di Torino	Paolo Manfredi, Antonio Carlucci, Michele Cusano, Marco Atlante, Stefano Grivet-Talocia, Riccardo Trinchero
SAE ITC	Tammy Patton
Samsung	Chulhee Cho*
Teradyne	Tomoo Tashiro
TSMC Japan 3DIC R+D Center	Raymond Yakura
Unaffiliated	Lance Wang, Graham Kus*
University of L'Aquila	Francesco De Paulis*
ZT Systems / AMD	Lu-Vong Phan, Saish Sawant

In the list above, attendees present at the meeting are indicated by "*." Those submitting an email ballot for their member organization for a scheduled vote are indicated by "^." Principal members or other active members who have not attended are in parentheses "( )." Participants who no longer are in the organization are in square brackets "[ ]."

UPCOMING MEETINGS

The connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting
Join on your computer or mobile app
Click here to join the meeting

Join with a video conferencing device
106010980@teams.bjn.vc
Video Conference ID: 114 666 897 5
Alternate VTC dialing instructions

Or call in (audio only)
+1 267-768-8015,554664847# United States, Philadelphia
Phone Conference ID: 554 664 847#
Find a local number | Reset PIN
Learn More | Meeting options

All teleconference meetings are 8:00 a.m. to 9:55 a.m. US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting.

NOTE: "AR" = Action Required.

SUMMIT MINUTES - SUMMARY AND LINKS

The 2025 IBIS Summit at the IEEE EMC+SIPI conference in Raleigh, NC was held both in-person and online in hybrid format. The notes below capture key content and discussions. A summit recording has been made available in 2 parts where time index is relative to the beginning of each part.

IBIS Summit presentations, their recordings and support materials are available at this link:

Link: https://www.ibis.org/summits/aug25/

OFFICIAL OPENING AND AGENDA

(Start 00:00:00, To 00:01:30. *Note: beginning of recording 1 of 2*)

Graham Kus acted as the on-site session chair for this IBIS summit.

Graham welcomed the attendees to the summit, and summarized that the summit would be scheduled between 8am and 12pm noon. He stated he would be Acting Session Chair. Graham introduced himself as Secretary of the IBIS Open Forum committee, and stated he would be reporting the Chair's Report on behalf of Doug Burns, as Doug was unable to attend this summit.

IBIS CHAIR'S REPORT

(Start 00:01:30, To 00:12:30)

Doug Burns (SI-Clarity, USA)

(Chair, IBIS Open Forum)

[Content presented by Graham Kus, Secretary, IBIS Open Forum]

Graham presented on the following:

- 27 IBIS Member Organizations
    - A consortium involving multiple companies- both EDA vendors, Hardware implementation companies, and ASIC/CPU chip vendors.
    - Synopsys and Ansys merged into one company, making them a single member, and we have not had an update on that new logo yet. [*Editorial Note: the individual members of the merged organization appear under Synopsys in this set of minutes.*]
    - The number of members by year has more or less moved between 25 and 35 members since 1995, these numbers have changed as acquisitions have come along.
    - Graham presented the IBIS Open Forum website and noted the logos represent membership. Kinger Cai stated that it appeared the logo for the company arm was missing from the shown slide- Graham noted this, and stated it would be updated at the conclusion of the summit after advising the Webmaster. [*Editorial Note: the slide in question was found to be obsolete, and the website was found to be correct during the time of the Summit*.]
- Roster of IBIS Officers June 2024 – May 2025
    - Summary of elected individuals representing organizations on board:
        - Chair: Douglas Burns, SI-Clarity LLC
        - Vice Chair: Walter Katz, The MathWorks
        - Secretary: Graham Kus

        - Treasurer: Randy Wolff, Siemens EDA
        - Librarian: Zhiping Yang, MST
        - Postmaster: Curis Clark, ANSYS/Synopsys
        - Webmaster: Steve Parker, Marvell
        - Additional liaison positions:
            - University Relations: Chulsoon Hwang, MST
            - IEEE DASC Liaison: Michael Mirmak, Intel
- IBIS Meetings (weekly teleconferences)
    - Quality task group (Tuesdays, 9:00 PT)
    - Advanced Technology Modeling (ATM) task group (Tuesdays, 12:00 PT)
    - Interconnect task group (Wednesdays, 8:00 PT)
    - Editorial task group (active depending on IBIS or Touchstone specification activities)
- IBIS Open Forum teleconference every 3 weeks (Fridays, 08:00 PT)
- IBIS Summit meetings (USA and international)
    - DesignCon, IEEE SPI, IEEE EMC+SIPI, Shanghai, Tokyo (JEITA-organized)
- Participants: ~290 in 2024
    - Participants listing
- SAE ITC
    - Industry Technologies Consortia is the parent organization of the IBIS Open Forum
    - SAE ITC representatives: Tammy Patton, Phyllis Gross, and Rich Demary
    - SAE ITC provides financial, legal, and other services to the IBIS Open Forum:
    - Link: https://www.sae-itc.com/
- Task Groups
    - Advanced Technology Modeling (ATM) task group (Tuesdays, 12:00 PT)
        - Chair: Arpad Muranyi, Siemens EDA
        - https://ibis.org/atm_wip/
        - Develop non-interconnect technical BIRDs
    - Editorial task group (Suspended)
        - Chair: Michael Mirmak, Intel
        - https://ibis.org/editorial_wip/
        - Produce IBIS specification documents
    - Interconnect task group (Wednesdays, 08:00 PT)
        - Chair: Michael Mirmak, Intel
        - https://ibis.org/interconn_wip/
        - Develop on-die/package/module/connector interconnect modeling BIRDs
    - Quality task group (Tuesdays, 09:00 PT)
        - Acting Chair: Randy Wolff, Siemens EDA
        - https://ibis.org/quality_wip/

        - Oversee IBISCHK parser testing and development
- IBIS Milestones
    - Various accomplishments and industry-associated activities shown in slides (Time index: 00:07:00)
- Other Work
    - Specification Development
        - BIRDs planned for IBIS 8.0 (Time index: 00:07:50)
    - IBIS work includes governing Touchstone 1.0 and Touchstone 2.1 specifications
        - Touchstone 2.1 specification passed January 2024 (Time index: 00:09:00)
    - IBISCHK: IBIS file syntax parser
        - Parser 7.2.1 delivered December 21, 2023 (Time index: 00:09:10)
    - TSCHK2: Touchstone file syntax parser
    - Both have freely available executables
    - Both source code by subscription if embedding in EDA tool
- BIRD description (Buffer Issue Resolution Document)
    - Summary of present BIRDs considered for adoption
- TSIRD description (Touchstone Issue Resolution Document)
    - Summary of present TSIRDs considered for adoption
- BUGs
    - How to submit bug reports for IBISCHK and TSCHK/TSCHK2
    - Summary of present BUGs considered for resolution
- Recent and Future Developments in IBIS
    - (Time index: 00:09:40)
    - Expanded system-level perspective
    - Power Integrity focused modeling
    - Multi-level analog buffer modeling
    - Interconnect modeling
    - Quality and Testing
    - Specification Clarification
    - What else should we be looking at? Bring your ideas!
- Participation in IBIS
    - (Time index: 00:10:20)
    - The success of IBIS depends on active participation and volunteering
    - Bringing your ideas and talents to IBIS
        - Task groups for technical discussions and document editing
        - IBIS email reflectors
        - Open Forum teleconferences for event planning and voting
        - Summit presentations
        - IBIS Board and task group volunteering

        - Writing BIRDs- Buffer Issue Resolution Documents
- IBIS Website Resources
    - (Time index: 00:11:40)
    - IBIS Summits
    - Task Group information
    - Member FAQ
    - Specification documents (IBIS and Touchstone)
    - BIRDs (IBIS), ISSIRDs (Spice), and TSIRDs (Touchstone)
    - Email support
    - Syntax parser downloads (IBISCHK for IBIS/IBIS-AMI and TSCHK for Touchstone)
    - Link: https://www.ibis.org

This concluded the Chair's report.

PRESENTATIONS:

IBIS MODELING SIMULATION ACCURACY IMPROVEMENT WITH SLEW RATE CORRECTION

(Start 00:13:20, To 00:46:00)

Yifan Ding (Missouri University of Science and Technology)

[Presented by Yifan Ding]

The presentation covered the following:

- Motivation
- Previous Work and Limitation
- Jitter Sensitivity-Based Direct Ku/Kd Modification with Slew Rate Correction(v3)
    - Methodology
    - Validation
- Conclusion
- Discussion

USB 3.0 IBIS-AMI MODEL CONSTRUCTION BASED ON MEASUREMENT AND NEURAL NETWORK

(Start 00:46:40, To 01:13:10)

Jiahuan Huang (Missouri University of Science and Technology)

[Presented by Jiahuan Huang]

The presentation covered the following:

- Motivation
- IBIS-AMI Model at USB 3.0 Tx
- Neural Network Training
- IBIS-AMI Model Construction and Validation
- Conclusion
- Discussion

IBIS POWER INTEGRITY INTRODUCTION

(Start 01:14:15, To 01:36:15)

Walter Katz (The MathWorks, USA)

[Presented by Walter Katz]

The presentation covered the following:

- Power Integrity Models of Silicon and Package
- Examples of Analysis That Can Be Done with These Models
- Rail Package Interconnect Model
- Rail Load Model
- Example of Rail Interconnect and Load Model
- Discussion Points, Next Steps
- Discussion

ALL STARTS FROM V=Z*I FOR PLATFORM PI & PD DESIGN

Kinger Cai, (arm)

[Presented by Kinger Cai]

(Start 01:36:35, To 02:13:15)

The presentation covered the following:

- Overview
  - “All starts from V=Z*I for platform PI & PD designs”
  - (PI = Power Integrity & PD = Power Delivery)
- Ohm’s Law in Power Delivery Network (PDN)
- Voltage design target: Vmin, Vmax, OS, US and Vpp in Time Domain
- Impedance design target: ACLL3/2/1 and DCLL in Frequency Domain
- Case Study: SPIM for LPDDR5X in JEDEC
- Discussion

BREAK

(Start 02:13:30, To 02:16:05)

(*Note: conclusion of Recording 1, beginning of Recording 2 of 2*)

- Note: Time indices now reference Recording 2 of 2.
- Link: https://www.ibis.org/summits/aug25/

BEHAVIORAL MODELING AND PARAMETER EXTRACTION OF VRMS FOR POWER INTEGRITY ANALYSIS

(Start 00:01:40, To 00:30:05)

Hanyu Zhang (Missouri University of Science and Technology)

Jiahuan Huang (MST EMC Laboratory)

Junho Joo (MST EMC Laboratory)

Chulsoon Hwang (MST EMC Laboratory)

[Presented by Hanyu Zhang]

The presentation covered the following:

- Background: VRM and PDN
- VRM behavioral model
- VRM model parameter extraction
- Validation
- Conclusion
- Discussion

REINFORCEMENT LEARNING-DRIVEN PCB PDN DESIGN AUTOMATION

(Start 00:31:00, To 00:48:00)

Haran Manoharan **(**Missouri University of Science and Technology)

Chulsoon Hwang (MST EMC Laboratory)

[Presented by Haran Manoharan]

The presentation covered the following:

- Introduction
- Post-Layout Decap Optimization
- Pre-Layout Decap Layout Synthesis
- Pre-Layout Power Plane Shape and Stack up Synthesis
- Future Works
- Discussion

BRIDGING EMF WITH CIRCUIT SIMULATION

(Start 00:48:40, To 01:17:15)

Kinger Cai (arm)

Michael Mirmak (intel)

Baolong Li (Cadence Design Systems)

Chite Chen (Asus)

[Presented by Kinger Cai]

The presentation covered the following:

- Outline:
    - Electromagnetic Field = EMF
    - Kirchhoff's Law
    - S-element in Netlist
- Discussion

OPEN DISCUSSION - IBIS OPEN FORUM

(Start 01:17:20, To 01:24:40)

Graham Kus announced the conclusion of the papers and announced the start of open discussion.

- Note: See Recording 2 for Q+A during Open Discussion.

CLOSING REMARKS

(Start 01:24:41, To 01:26:53)

Graham Kus thanked the sponsor IEEE EMC+SIPI Society, its President John La Salle, Chair Bruce Archambeault, Ph.D. and Vice Chair Stephen Scearce. Also, the IEEE EMC+SIPI for providing the room, A/V and MS-Teams hybrid-meeting support, and other considerations. Graham encouraged members and attendees to attend IBIS Open Forum meetings, as well as contributing to a potential upcoming Touchstone 3.0 Specification and IBIS 8.0 Specification as part of editorial support. Graham reported that it is expected that IBIS 8.0 Specification may be ratified by the conclusion of this calendar year. Graham thanked everyone for attending. He noted the next meeting would be September 5, 2025. The meeting adjourned.

NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on September 5, 2025.

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NOTES

IBIS CHAIR: Douglas Burns
vice-chair@ibis.org
CEO and Signal and Power Integrity Consultant, SI-Clarity, LLC.

IBIS VICE CHAIR: Walter Katz
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SECRETARY: Graham Kus
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SOCIAL MEDIA CHAIR: Edna Moreno
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This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.

- To ask specific questions for individual response.
- To subscribe to or unsubscribe from the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org):
    - https://www.freelists.org/list/ibis
    - https://www.freelists.org/list/ibis-users
- To subscribe to or unsubscribe from one of the Task Group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, ibis-editorial@freelists.org, or ibis-quality@freelists.org:
    - https://www.freelists.org/list/ibis-macro
    - https://www.freelists.org/list/ibis-interconn
    - https://www.freelists.org/list/ibis-editorial
    - https://www.freelists.org/list/ibis-quality
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: ibischk7, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

The BUG Report Form for IBISCHK resides along with reported BUGs at:

https://ibis.org/bugs/ibischk/
https://ibis.org/ bugs/ibischk/bugform.txt

The BUG Report Form for TSCHK2 resides along with reported BUGs at:

https://ibis.org/bugs/tschk/
https://ibis.org/bugs/tschk/bugform.txt

The BUG Report Form for icmchk resides along with reported BUGs at:

https://ibis.org/bugs/icmchk/
https://ibis.org/bugs/icmchk/icm_bugform.txt

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

https://ibis.org/bugs/s2ibis/bugs2i.txt
https://ibis.org/bugs/s2ibis2/bugs2i2.txt
https://ibis.org/bugs/s2iplt/bugsplt.txt

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

https://ibis.org/

Check the IBIS file directory on IBIS.org for more information on previous discussions and results:

https://ibis.org/directory.html

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SAE STANDARDS BALLOT VOTING STATUS (attendee X; absent -)

Organization	Interest Category	Standards Ballot Voting Status	June 27, 2025	July 18, 2025	August 8, 2025	August 22, 2025
Altair	User	Inactive	-	-	-	-
AMD (Xilinx)	Producer	N/A	-	-	-	-
Analog Devices	Producer	Inactive	-	-	-	-
Applied Simulation Technology	User	Inactive	-	-	-	-
arm	Producer	Inactive	-	-	-	X
Aurora System	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	X	X	X	X
Ciena	User	Inactive	-	-	-	-
Cisco Systems	User	Inactive	-	-	-	X
Dassault Systems	User	Inactive	-	-	-	-
GE Healthcare Technologies	User	Inactive	-	-	-	-
Google	User	Inactive	-	-	-	X
Huawei Technologies	Producer	Inactive	-	-	-	-
Infineon Technologies AG	Producer	Inactive	-	-	-	X
Intel Corp.	Producer	N/A	X	X	X	X
Keysight Technologies	User	Inactive	-	-	-	-
Marvell	Producer	Inactive	X	-	X	X
MathWorks	User	Active	X	X	X	X
Micron Technology	Producer	Inactive	-	-	-	-
MST EMC Lab	User	Active	X	X	X	X
SI-Clarity	User	Active	X	X	X	-
Siemens EDA	User	Active	X	X	X	X
Signal Edge Solutions	User	Inactive	-	-	-	-
STMicroelectronics	User	N/A	-	-	-	-
Synopsys	User	Active	X	X	X	X
ZTE Corp.	User	Inactive	-	-	-	-
Zuken	User	Inactive	-	-	-	-

N/A = Temporarily not a voting member

Criteria for SAE member in good standing:

- Must attend two consecutive meetings to establish voting membership.
- Membership dues current
- Must not miss two consecutive meetings (voting by email counts as attendance)

Interest categories associated with SAE standards ballot voting are:

- Users - members that utilize electronic equipment to provide services to an end user.
- Producers - members that supply electronic equipment.

General Interest - members are neither producers nor users. This category includes, but is not limited to, government, regulatory agencies (state and federal), researchers, other organizations, and associations, and/or consumers.