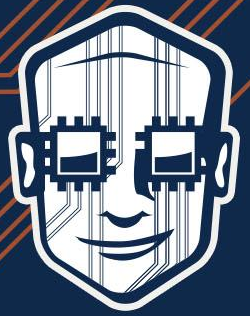
DesignCon® 2015



Panel 8-WE7
3:45 – 5:00 pm

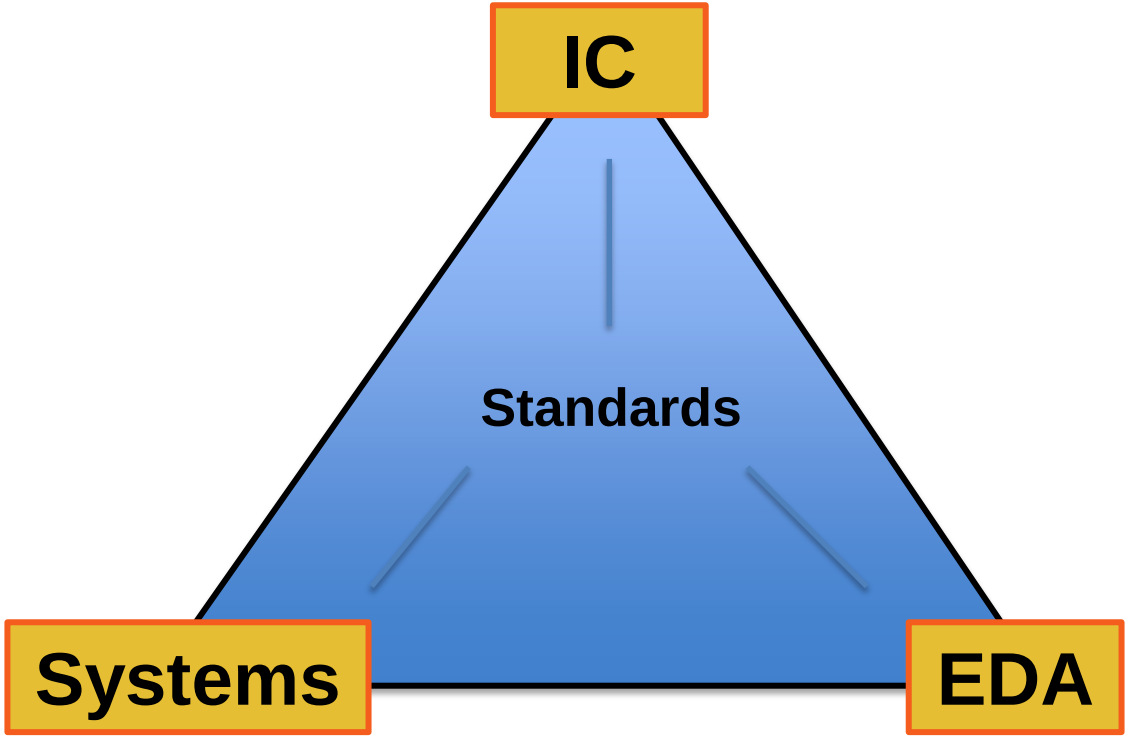
Can we use AMI analysis to predict meaningful BERs?

UBM

Welcome to Technical Panel 8-WE7

- Can we use AMI analysis to predict ***meaningful*** BERs?
- Donald Telian, SI Consultant, SiGuys
- Panel Format:
  - 7 Panelists, 7 Questions
  - Time for audience questions

7 Panelists



2 IC
2 Systems
2 EDA
1 Standards

7 Panelists

- IC
  - Adge Hawes, IBM
  - Bob Miller, Avago
- Systems
  - Anders Ekholm, Ericsson
  - Brian Baek, Cisco
- EDA
  - Fangyi Rao, Keysight
  - Mike Steinberger, SiSoft
- Standards
  - Michael Mirmak, IBIS Chair (Intel)

Question #1 of 7

Introduce yourself and your role at your company. Outline your company's and your personal involvement with AMI models.

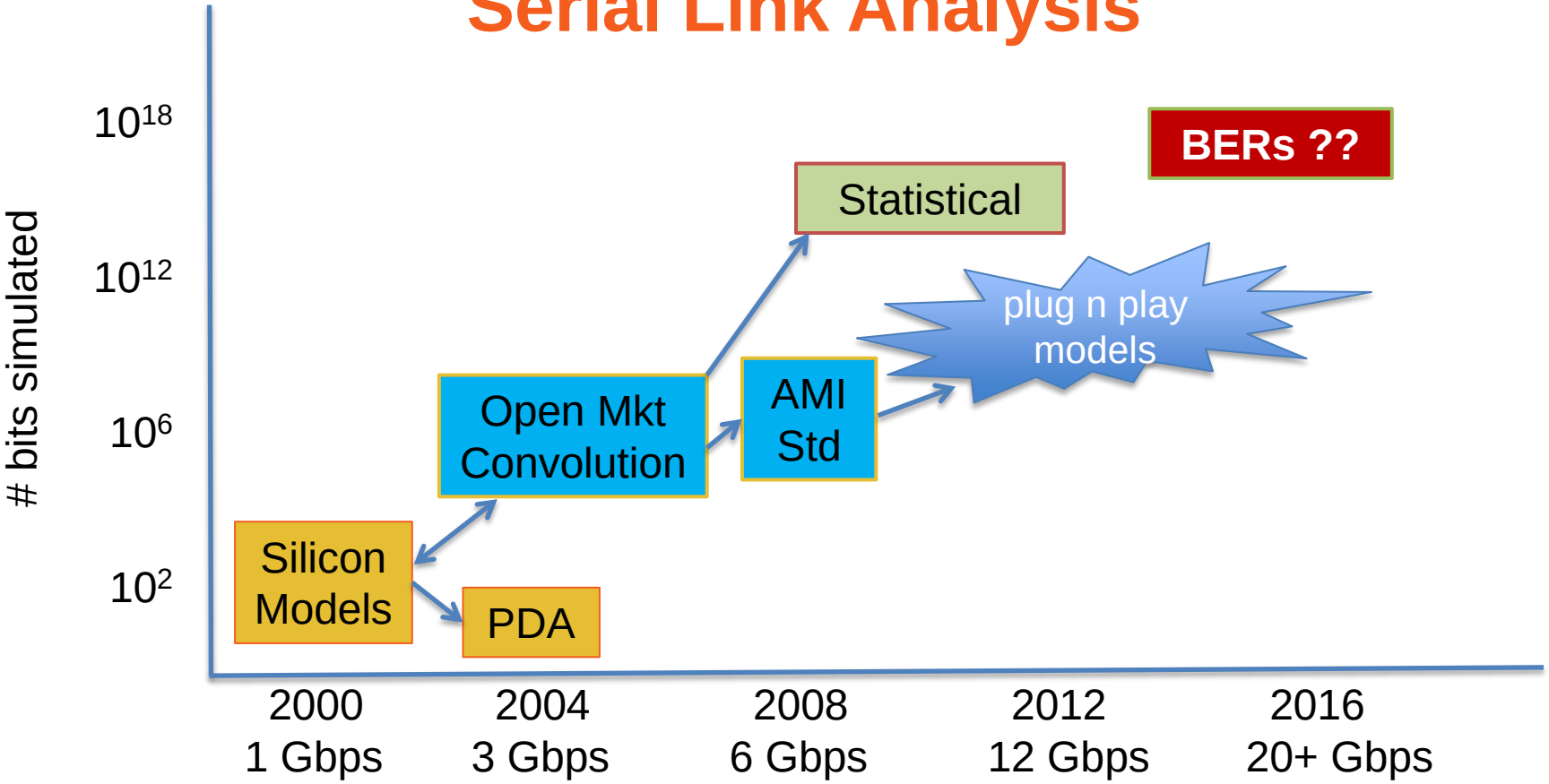
Fangyi Rao, Keysight Technologies, EEsof

- Master R&D engineer of Advanced Design System (ADS)
- ADS provides simulation tools for analog/RF circuit, EM and channel simulations with AMI models
- Keysight is a member company of IBIS
- Involved in IBIS committee activities since 2009. One of the authors of IBIS 6.0
- Worked with major silicon vendors on AMI model development and verification

Mike Steinberger – AMI Modeling Experience

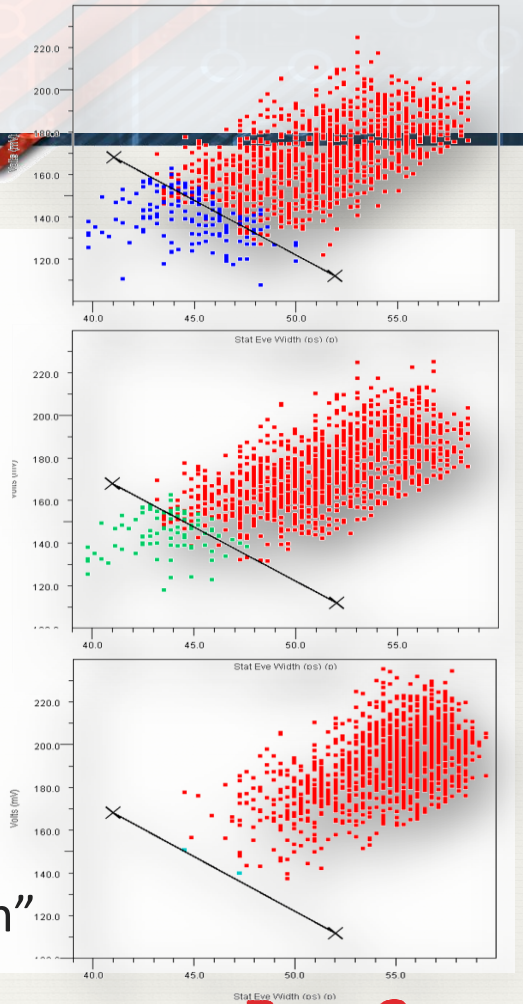
- SiSoft - Lead Architect, Serial Channel Products
- Wrote section 10 of IBIS 5.0
- First to publish source code for an AMI model (Tx in July 2007)
- Primary developer of IBIS_AMI_test utility
- Co-authored first DesignCon paper on AMI modeling (DesignCon2008)
- Wrote or co-wrote >20 Tx and >20 Rx models for >10 different IP vendors.
- Delivered AMI model development training to four IP vendors.

Serial Link Analysis



Resolving Performance

- Relevant metric is BER
  - Not eye height and width
    - Over design
    - Height/width trading
  - BER ~= diagonal line
- Design changes simpler to resolve against BER
- DesignCon 2014 8-FR1
  - “Moving Higher Data Rate Systems into Production”



7 Questions

1. Who are you? (done)
2. Where is AMI at?
3. How good are the models?
4. What is needed for a BER?
5. Can we form meaningful BERs?
6. What is next?
7. How can we help?

Audience Questions >

Ground Rules

- Can we use AMI analysis to predict ***meaningful*** BERs?

- Panelist allowed 1 minute for each question
  – Countdown timer – join in, if you like

- Red flags (1 each)
  – 30 second interruption at any time
  – Interrupt – original panelists still gets full minute

Question #2

Comment on the availability and maturity of AMI models.
Are they simple to get? Do they work correctly?

If not, what are the main problems?
What or who is hindering AMI proliferation?
Tool, IC, Systems vendors? Standards issues?

4:00 - AE

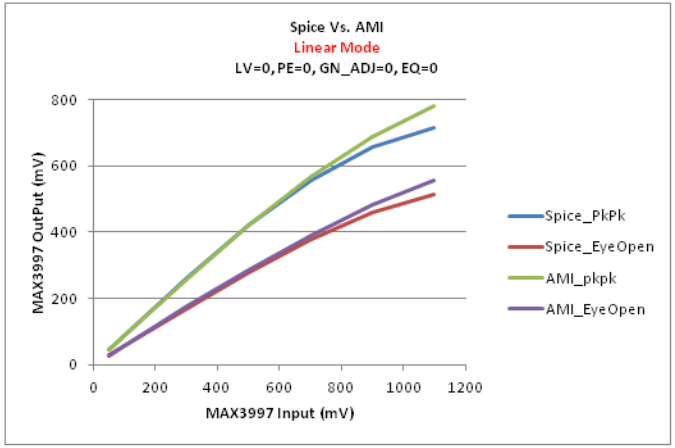
Question #3

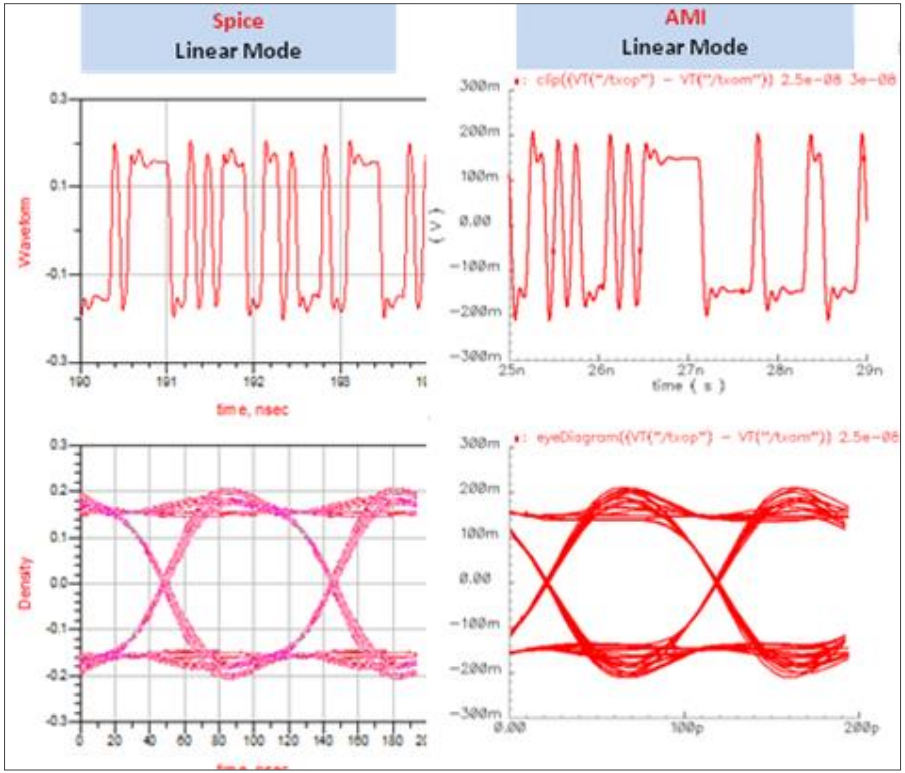
Assuming you have a working AMI model, does it come with documentation describing how to judge simulation results such as eye height and width targets? When available, how is this expressed and does it help you quantify design margin?

Furthermore, is there documentation that explains how accurately the model represents the actual device?
If so, was the reference data simulation or measurement, and how well did it match?

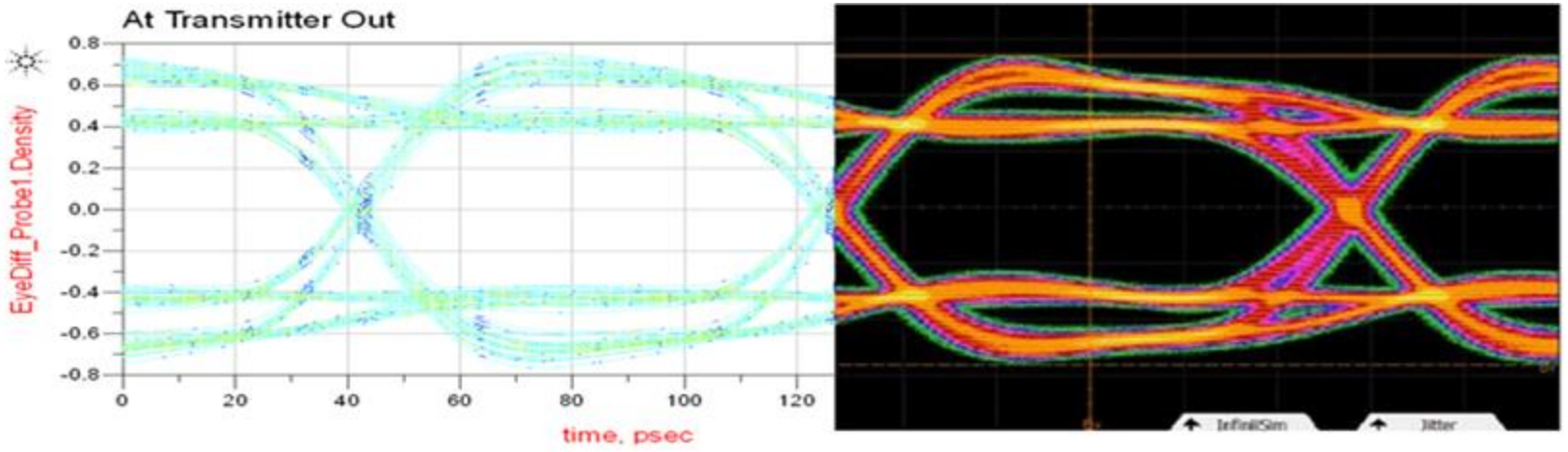
4:08 - BM

AMI Model Correlation with SPICE Simulation

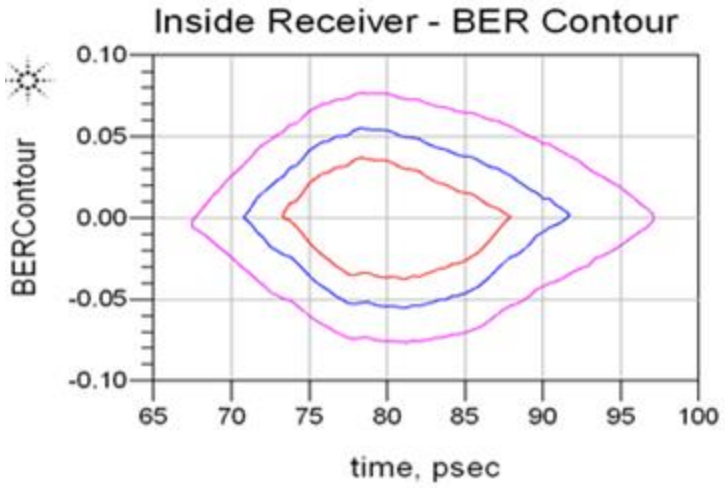


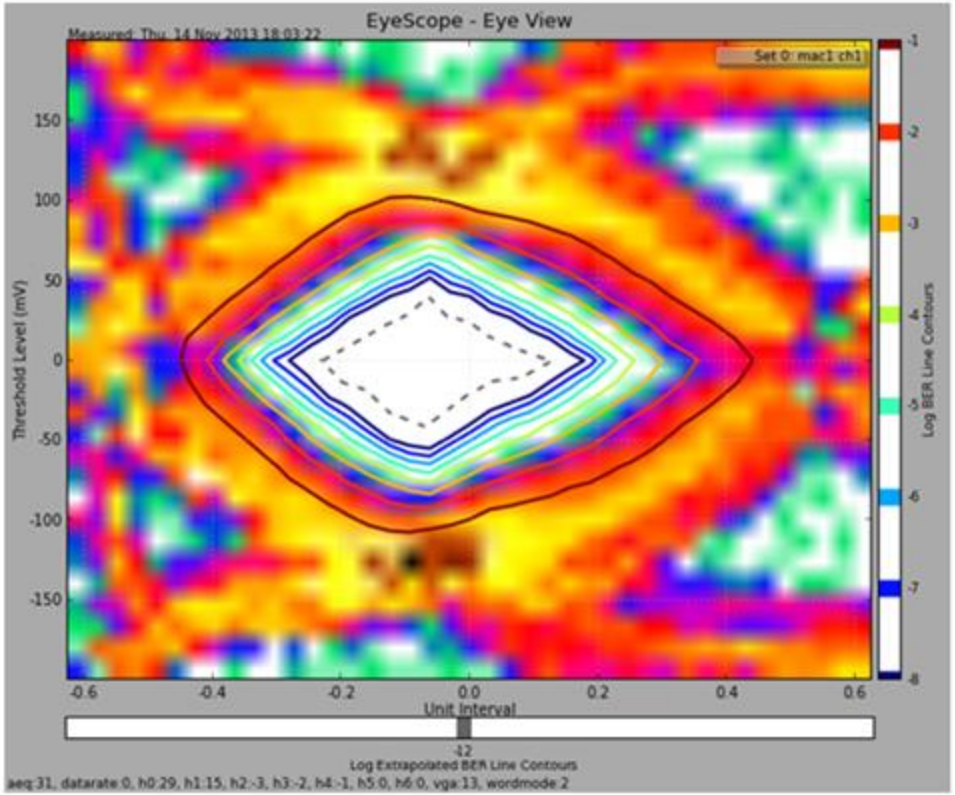


AMI Model Correlation with Measurement: Tx

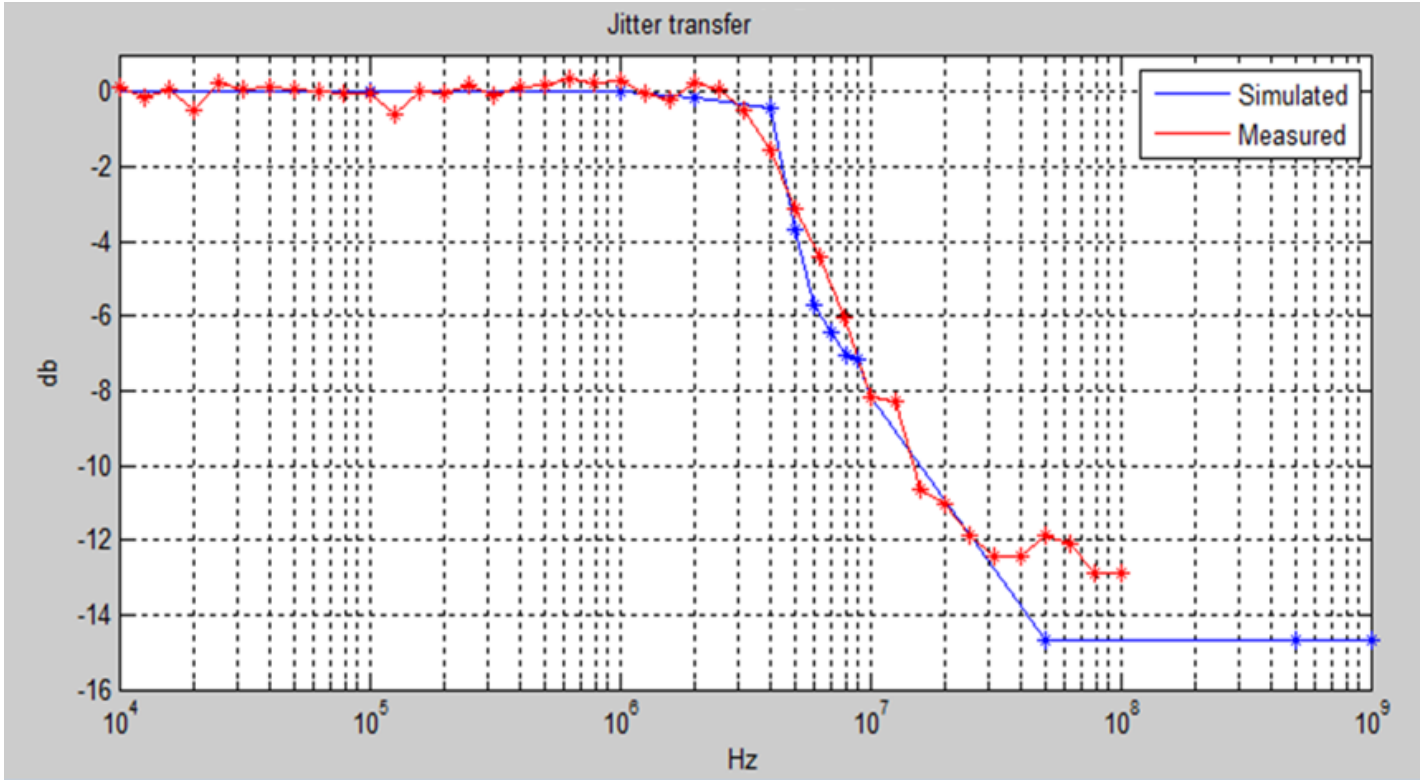


AMI Model Correlation with Measurement: Rx





AMI Model Correlation with Measurement: CDR



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Question #4

Do you find the industry is confusing eye opening probabilities with BERs?
How would you describe the relationship between the two?

Are Rx_Sensitivity, Rx_Clock_PDF and Rx_Clock_Recovery parameters specified correctly?
What is necessary to determine BERs?
Do we uniformly agree on how this is to be done?

4:16 - FR

Question #5

Can we use AMI models to produce meaningful BERs?

What is missing, and who needs to provide it
(IC, Systems, Tools, Standards)?

What type(s) of analysis must be used?
(PDA, Statistical, TimeDomain, Convolution, ??)
Please propose solutions and not blame.

4:24 - MS

Question #6

Once BERs are working correctly and reliably, what is the next issue IBIS-AMI should address?

4:32 - BB

Question #7

What can attendees in the audience DO to help us bring AMI analysis to the next level?

What else would you like to say to others on the Panel, and/or others with similar job functions?

4:40 - MM

Audience Questions

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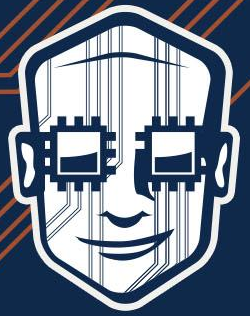

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THANK YOU

UBM