

SPI 2012



16th IEEE Workshop on

SIGNAL AND POWER INTEGRITY

Grand Hotel Parco dei Principi

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Program



Organized by:



University of Cassino and Southern Lazio
Italy



University of Naples Federico II
Italy

Sponsored by:



IEEE Components, Packaging and
Manufacturing Technology Society

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EMC-S Italy Chapter

IEEE Electromagnetic Compatibility Society

MAY 13 – SUNDAY

19.00 – Welcome party – Grand Hotel Parco dei Principi

MAY 14 – MONDAY

9.00 – 9.10 Opening ceremony.

9.10 – 9.50 Invited lecture

Trends and technical challenges for high speed serial communications on copper and optical media

Ivan Bietti - STMicroelectronics, ITALY

9.50 – 10.50 Session 1: HIGH-SPEED CIRCUITS DESIGN, MANAGEMENT, TESTING AND CHARACTERIZATION- PART 1

9.50-10.10: Broadband Performance of 110 GHz Interconnects Built in HRSi-Based Membrane Technology

U. Arz¹, M. Rohland^{1,2}, K. Kuhlmann¹, S. Büttgenbach²

¹Physikalisch-Technische Bundesanstalt, Braunschweig, GERMANY

²Institut für Mikroelektronik, Braunschweig, GERMANY

10.10-10.30: Temperature Constrained Power Management Scheme for 3D MPSoC

A. Aggarwal, S. S. Kumar, A. Zjajo, R. van Leuken,
Delft University of Technology, THE NETHERLANDS

10.30-10.50: Skinny Trace Compensation Methodology for High Speed Serial Interface

M. Mi¹, S. Taliaferro¹, R. Murugan¹, D. de Araujo²

¹Texas Instruments, Dallas, TX, USA; ²Nimbic, Mount. View, CA, USA

10.50 – 11.20 coffee-break

11.20 – 12.40 Session 1: HIGH-SPEED CIRCUITS DESIGN, MANAGEMENT, TESTING AND CHARACTERIZATION- PART 2

11.20-11.40: 2-Channel 2-Layer Inner-Stack Memory-module Design for LPDDR2/3 DRAM

Jongjoo Lee, J. K. Paek, Joonhee Lee
Samsung Electronics, Hwasung-city, Republic of KOREA

11.40-12.00: Multistandard Circuits for NRZ serial communication up to 14Gbps.

S. Erba - STMicroelectronics, Pavia, ITALY

12.00-12.20: The Role of Impedance Control in Early Detection of Interconnect Degradation Using Time Domain Reflectometry

M. H. Azarian, F. C. Schneider
CALCE, University of Maryland, College Park, MD, USA

12.20-12.40: Electro-thermal reduced equivalents of highly integrated systems with multi-port Positive Fraction Foster expansion

¹V. d'Alessandro, ¹M. de Magistris, ¹A. Magnani, ¹N. Rinaldi, S. Russo², ¹Univ. of Naples Federico II, ITALY, ²Meridiana Italia, ITALY

12.40 – 14.00 lunch

14.00 – 15.20 Session 2: ELECTROMAGNETIC MODELING

14.00-14.20: Method of Moment Solution of Surface-Volume-Surface Electric Field Integral Equation for Two-Dimensional Transmission Lines of Complex Cross-Sections

A. Menshov, V. Okhmatovski, University of Manitoba, CANADA

14.20-14.40: Efficient Inclusion of Layered Media Green's Functions in Full-wave Analysis of Microstrips

A. G. Chiariello¹, A. Maffucci²

¹SUN Univ. of Naples; ²Univ. of Cassino and Southern Lazio, ITALY

14.40-15.00: S-Parameter Extraction of Bond Wires Based on EM Field Simulations of Computed Tomography-Generated 3D CAD Models

J. Hillebrand, S. Kieß, M. Wróblewski, S. Simon
University of Stuttgart, Stuttgart, GERMANY

15.00-15.20: Electromagnetic Modeling of Non-uniform Through-Silicon Via (TSV) Interconnections

B. Xie, M. Swaminathan, Georgia Institute of Technology, USA

15.20 – 17.00 Poster presentation and poster session

System Fidelity Factor in analysis of inverter-interconnect-inverter VLSI systems

W. Bandurski - Poznan Univ. of Technology, POLAND

Microstrip line modelling in the presence of interfering metal strips according to their orientation

T. Le Gouguec, P.-M. Martin, Université de Brest, FRANCE

Impact of Radiation Loss in On-Chip Transmission-Line for Terahertz Applications

A. Tsuchiya¹, H. Onodera^{1,2} - ¹Kyoto Univ.; ²PESEC, Kyoto Univ., JAPAN

FORMOSAT-5 Satellite Power Distribution Circuitry Development

C.C. Huang, C.K. Tseng, J.J. Yeh - National Space Organ., TAIWAN

A New Frequency-Variant Transmission Line Parameter Determination Technique for Very High-Speed Signal Propagation Characterization

H. Kim¹, S.C. Ji², Y. Eo¹

¹Hanyang Univ., Ansan; ²Daeduck Electronics Co. Ltd, Ansan, KOREA.

Intra-rack optical interconnection links

V. Ricchiuti, CPE Italia S.p.A., Italy

17.30 – Social event: guided tour to Sorrento

MAY 15 – TUESDAY

9.00 – 10.40 Session 3: MACROMODELING

9.00-9.20: Tree-Based Sequential Sampling Algorithm for Scalable Macromodeling of High-Speed Systems

K. Chemmangat, F. Ferranti, T. Dhaene, L. Knockaert
Ghent University-IBBT, Gent, BELGIUM

9.20-9.40: A guaranteed-convergence framework for passivity enforcement of linear macromodels

S. Grivet-Talocia, A. Chinea, G. C. Calafiore
Politecnico di Torino, ITALY

9.40-10.00: Parameterized Model Order Reduction of Delayed Systems using an Interpolation Approach with Amplitude and Frequency Scaling Coefficients

F. Ferranti¹, M. Nakhla², G. Antonini³, T. Dhaene¹, L. Knockaert¹, A.E. Ruehli⁴
¹Ghent University, BELGIUM, ²Carleton University, Ottawa, CANADA, ³University of L'Aquila, L'Aquila, ITALY, ⁴Missouri Univ., Rolla, USA.

10.00-10.20: Improving the Accuracy of Rational Macromodels via Mode-Revealing Transformations

B. Gustavsen - SINTEF Energy Research, Trondheim, NORWAY

10.20-10.40: Parameterized Reduced Order Models with Guaranteed Passivity using Matrix Interpolation

E. R. Samuel, F. Ferranti, L. Knockaert, T. Dhaene
Ghent University - IBBT, Gent, BELGIUM

10.40 – 11.00 coffee-break

11.00 – 11.40 Invited lecture

Challenges and perspectives in nanoscale electromagnetics

S. A. Maksimenko, Belarus State University - Minsk, BELARUS

11.40 – 12.40 Session 4: INNOVATIVE NANO-INTERCONNECTS

11.40-12.00: Signal integrity analysis of carbon-based on-chip nano-interconnects

G. Chiariello¹, A. Maffucci², G. Miano³
¹SUN University of Naples; ²University of Cassino and Southern Lazio, ³University of Naples Federico II, ITALY

12.00-12.20: Graphene Nanostrip Lines: Dispersion and Attenuation Analysis

R. Araneo, G. Lovat, P. Burghignoli - Sapienza Univer. of Rome, ITALY

12.40 – 14.00 lunch

14.00-15.00 Session 5: TRANSMISSION LINES MODELING

14.00-14.20: Performance of Modal Signaling vs. Medium Dielectric Variability

P. Manfredi, I. S. Stievano, F. G. Canavero
Politecnico di Torino, ITALY

14.20-14.40: Frequency and Time Domain Variability Analysis of an On-Chip Inverted Embedded Microstrip Line Using a Macro-modeling-based Stochastic Galerkin Method

D. Vande Ginste¹, D. De Zutter¹, D. Deschrijver¹, T. Dhaene¹, P. Manfredi², F. Canavero²
¹Ghent University, BELGIUM, ²Politecnico di Torino, ITALY

14.40-15.00: A Multi-Core High-Order A-stable and L-Stable Integration Method for Fast Transient Simulation of High-Speed Interconnect and Transmission Line Circuits

M. Farhan¹, E. Gad², M. Nakhla¹, R. Achar¹
¹Carleton University, Ottawa; ²University of Ottawa, CANADA

15.45 – Guided tour to Amalfi Coast and Social dinner

MAY 16 - WEDNESDAY

9.00 – 10.00 Session 6: I/O MODELING

9.00-9.20: Efficient Table-Based I-Q Behavioral Model for High-Speed Digital Buffers/Drivers

W. Dghais, H.M. Teixeira, T. R. Cunha, J. C. Pedro
Universidade de Aveir, Aveiro, PORTUGAL.

9.20-9.40: IBIS Modeling Using Latency Insertion Method (LIM)

J. E. Schutt-Ainé¹, J. Tan², P. Liu², F. Al-Hawari², A. Varma²
¹University of Illinois at Urbana-Champaign, Urbana, IL, USA.
²Cadence Design Systems, Chelmsford, MA, USA.

9.40-10.00: Versatile surrogate models for IC buffers

C. Diouf¹, M. Telescu¹, I. S. Stievano², F. C. Canavero², P. Cloastre¹, N. Tanguy¹ - ¹Université Européenne de Bretagne, Université de Brest, FRANCE; ²Politecnico di Torino, ITALY

10.00 – 10.30 coffee-break

10.30–11.10 Session 7: SIGNAL AND POWER INTEGRITY

10.30-10.50: SSO Noise and Conducted EMI: Modeling, Analysis, And Design Solutions

P. J. Dorio¹, A. Sanna¹, A. Chandra², C. Forzan¹, D. Pandini¹
¹STMicroelectronics, Agrate Brianza, ITALY, ²STMicroelectronics, Greater Noida, INDIA

10.50-11.10: Methods for Calculation of Eye Diagrams for Digital Links with Multiple Aggressors Having Unknown Time Offsets

D. Timmermann¹, R. Rimolo-Donadio², Y. H. Kwark², T.-M. Winkel³, C. Siviero³, H. Harrer³, C. Schuster¹

¹Technische Universität Hamburg-Harburg, Hamburg, GERMANY,
²IBM T. J. Watson Research Center Yorktown Heights, New York, USA
³IBM Deutschland Research & Development, Böblingen, GERMANY.

11.10 – 11.20: SPI2012 Closing Ceremony.

13.00 – 18.00 IBIS MEETING

European IBIS Summit Meeting.

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