# TABLE OF CONTENTS

## SESSION 1: Device Characterization  
Co-chairs: Michael Cresswell, NIST and Colin McAndrew, Freescale Semiconductor

1.1 Using High Precision On-Wafer Backend Capacitor Mismatch Measurements using a Benchtop Semiconductor Characterization System, **H. Tuinhout** and **F. van Rossem***, NXP-TSMC Research Center, Eindhoven, The Netherlands and *University of Twente, Enschede, The Netherlands**

1.2 Static Noise Margin Evaluation Method Based on Direct Polynomial-Curve-Fitting with Universal SRAM Cell Inverter TEG Measurement, **K. Nakamura**, **K. Noda**, and **H. Koike***, Kyushu Institute of Technology, and *Fukuoka Industry, Science & Technology Foundation, Japan**

1.3 Addressable Arrays Implemented with One Metal Level for MOSFET and Resistor Variability Characterization, **M.B. Ketchen**, **M. Bhushan***, and **G. Costrini***, IBM Research, T.J. Watson Research Center, Yorktown Heights, NY and *IBM Systems & Technology Group, Hopewell Junction, NY**

1.4 Accurate Time Constant of Random Telegraph Signal Extracted by a Sufficient Long Time Measurement in Very Large-Scale Array TEG, **T. Fujisawa**, **K. Abe**, **S. Watabe**, **N. Miyamoto**, **A. Teramoto**, **S. Sugawa**, and **T. Ohmi**, Tohoku University, Japan

## SESSION 2: MEMS/Sensors  
Co-chairs: Yoshio Mita, University of Tokyo and Anthony Walton, University of Edinburgh

2.1 Extracting Resistances of Carbon Nanostructures in Vias, **W. Wu**, **S. Krishnan**, **K. Li**, **X. Sun**, **R. Wu**, and **C.Y. Yang**, Santa Clara University, Santa Clara, CA

2.2 Demonstration of a Submicron Damascene Cu/Low-k Mechanical Sensor to Monitor Stress in BEOL Metallisation, **C.J. Wilson**, **K. Croes***, **Z. Tokei***, **G.P. Beyer***, **A.B. Horsfall**, and **A.G. O’Neill**, Newcastle University, Newcastle, United Kingdom and *IMEC, Leuven, Belgium**

2.3 Test Structure to Extract Circuit Models of Nanostructures Operating at High Frequencies, **F.R. Madriz**, **S. Krishnan**, **X. Sun**, and **C.Y. Yang**, Santa Clara University, Santa Clara, CA

2.4 Test Chip to Evaluate Measurement Methods for Small Capacitances, **J.J. Kopanski**, **M. Yaqub Afridi**, **C. Jiang**, and **C.A. Richter**, National Institute of Standards and Technology, Gaithersburg, MD
SESSION 3: Matching
Co-chairs: Hans Tuinhout, NXP and Mark Poulter, National Semiconductor Corp.

3.1 An Enhanced Model for Thin Film Resistor Matching, T.G. O'Dwyer and M.P. Kennedy*, Analog Devices B.V., Limerick, Ireland and *University College, Cork, Ireland

3.2 Application of Matching Structures to Identify the Source of Systematic Dimensional Offsets in GHOST Proximity Corrected Photomasks, S. Smith, A. Tsiamis, M. McCallum*, A.C. Hourd**, J.T.M. Stevenson, and A.J. Walton, The University of Edinburgh, Edinburgh, United Kingdom, *Nikon Precision Europe, Livingston, United Kingdom and **Compugraphics International Ltd., Glenrothes, United Kingdom

3.3 An Analysis of Temperature Impact on MOPSFET Mismatch, S. Mennillo, A. Spessot, L. Vendrame, and L. Bortesi, Numonyx, Agrate Brianza, Italy

3.4 MOSFET Mismatch Measure Improvement Using Kelvin Test Structures, C.M. Mezzomo, M. Marin and G. Ghibaudo*, STMicroelectronics, Crolles, France and *IMEP-LAHC, Grenoble, France

SESSION 4: Poster Presentations
2:50 p.m. - 3:30 p.m.
Co-chairs: Willie Sansen, KU Leuven and Richard Allen, NIST

4.1 Withdrawn

4.2 A Test Structure for Spectrum Analysis of Hot-Carrier-Induced Photoemission from Scaled MOSFETs under DC and AC Operations, T. Matsuda, T. Maezawa, H. Iwata, and T. Ohzone*, Toyama Prefectural University and *Dawn Enterprise, Japan

4.3 Application of a Micromechanical Test Structure to the Measurement of Stress in an Electroplated Permalloy Film, S. Smith, N. Brockie, J.G. Terry, A.B. Horsfall*, G. Pringle**, A. O'Hara**, and A.J. Watson, The University of Edinburgh, Edinburgh, United Kingdom, *Newcastle University, Newcastle, United Kingdom and **Memsstar Technology, Livingston, United Kingdom

4.4 Measurement of MOSFET C-V Curve Variation using CBCM Method, K. Tsuji, K. Terada, T. Tsunomura*, and A. Nishida*, Hiroshima City University, Hiroshima, Japan and *MIRAI-Selete, Tsukuba, Japan

4.5 Array Test Structure for Ultra-Thin Gate Oxide Degradation Issues, K.M. Hafkemeyer, A. Domdey, D. Schroeder and W.H. Krautschneider, Hamburg University of Technology, Hamburg, Germany
4.6 Non-Contact, Pad-less Measurement Technology and Test Structures for Characterization of Cross-Wafer and In-Die Product Variability, G. Steinbrueck, J.S. Vickers, M. Babazadeh, M. Pelella, and N. Pakdaman, tau-Metryx, Inc., Santa Clara, USA

4.7 Test Structure for High-Voltage LD-MOSFET Mismatch Characterization in 0.35 um HV-CMOS Technology, W. Posch, M. Christian and E. Seebacher, austriamicrosystems AG, Unterpremstatten, Austria

4.8 Automated Test Structure Generation for Characterizing Plasma-Induced Damage in MOSFET Devices, T. Zwingman, A.J. West and A. Gabrys, National Semiconductor Corp., Santa Clara, CA

SESSION 5: Process Characterization I
Co-chairs: Christopher Hess, PDF Solutions and Kelvin Doong, TSMC

5.1 Advanced Method for Measuring Ultra-Low Contact Resistivity between Silicide and Silicon based on Cross-Bridge Kelvin Resistor, T. Isogai, H. Tanaka, A. Teramoto, T. Goto, S. Sugawa, and T. Ohmi, Tohoku University, Sendai, Japan

5.2 A Test Structure for Statistical Evaluation of Characteristics Variability in a Very Large Number of MOSFETs, S. Watabe, S. Sugawa, K. Abe, T. Fujisawa, N. Miyamoto, A. Teramoto, and T. Ohmi, Tohoku University, Sendai, Japan

5.3 Estimating MOSFET Leakage from Low-cost, Low-resolution Fast Parametric Test, T. Uezono, R. Lindley, A. Swimmer, S. Winters, R. Vallishayee, S. Saxena, PDF Solutions, Richardson, TX

5.4 Test Structures Utilizing High-Precision Fast Testing for 32nm Yield Enhancement, M. Karthikeyan, L. Medina and E. Shiling, IBM Systems and Technology Group, Hopewell Junction, NY

SESSION 6: Parameter Extraction
Co-chairs: Larg Weiland, PDF Solutions and Hi-Deok Lee, Chungnam National University


6.2 Parameter Extraction for the PSP MOSFET Model by the Combination of Genetic and Levenberg-Marquardt Algorithms, Q. Zhou, W. Yao, W. Wu, X. Li, Z. Zhu, and G. Gildenblat, Arizona State University, Tempe, AZ
6.3 Characterization and Modeling of Mechanical Stress in Silicon-based Devices, A. Spessot, A. Colombi, G.P. Carnevale, and P. Fantini, Numonyx, Agrate Brianza, Italy


SESSION 7: CD Metrology
Co-chairs: Loren Linholm and Dieter Schroder, Arizona State University


7.2 Electrical Test Structures for Investigating the Effects of Optical Proximity Correction, A. Tsiamis, S. Smith, M. McCallum*, A.C. Hourd**, J.T.M. Stevenson, and A.J. Walton, The University of Edinburgh, Edinburgh, United Kingdom, *Nikon Precision Europe, Livingston, United Kingdom and **Compugraphics International Ltd., Glenrothes, United Kingdom

7.3 Mapping the Edge-Roughness of Test Structure Features for Nanometer-Level CD Reference-Materials, M.W. Cresswell, M. Davidson*, G.I. Mijares, R.A. Allen, J. Geist, and M. Bishop**, National Institute of Standards and Technology, Gaithersburg, MD, *Spectel Research Corp., Palo Alto, CA and **International SEMATECH, Austin, TX

SESSION 8: RF
Co-chairs: Franz Sischka, Agilent Technologies and Kevin McCarthy, University College, Cork


8.2 Characterization and Model Parameter Extraction of Symmetrical Centre Tapped Inductor using Build in Mixed Mode and Pure Differential S-Parameters, F. Gianesello, Y. Morandini, S. Boret, and D. Gloria, STMicroelectronics, Crolles, France
8.3 In-Situ Silicon Integrated Tuner for Automated on-Wafer MMW Noise Parameters Extraction of Si HBT and MOSFET in the Range of 60 - 110GHz, Y. Tagro, D. Gloria, S. Boret, Y. Monandini, and G. Dambrine*, STMicroelectronics, Crolles, France, and *IEMN, Villeneuve d'ascq, France

SESSION 9: Process Characterization II
Co-chairs: Brad Smith, Freescale Semiconductor and Hugues Brut, STMicroelectronics


9.2 Metal and Dielectric Thickness: A Comprehensive Methodology for Back-End Electrical Characterization, L. Bortesi and L. Vendrame, Numonyx, Agrate Brianza Agrate, Italy

9.3 A Test Structure for Assessing Individual Contact Resistance, F. Liu and K. Agarwal, IBM Austin Research Lab., Austin, TX

9.4 Fast Embedded Characterization of FEO Variations in MOS Devices, F. Rigaud, STMicroelectronics, Rousset, France

SESSION 10: Capacitance
Lee Stauffer, Keithley Instruments and Satoshi Habu, Agilent Technologies Japan, Ltd.

10.1 Benefit of Direct Charge Measurement on Interconnect Capacitance Measurement, Y. Miyake and M. Goto, Agilent Technologies International Japan Ltd., Tokyo, Japan


10.3 Practical Considerations for Measurements of Test Structures for Dielectric Characterization, W. Chen, K.G. McCarthy, and A. Mathewson, University College, Cork, Ireland

10.4 Test Structure Design, Extraction, and Impact Study of FEOL Capacitance Parameters in Advanced 45nm Technology, S. Ekbote, P. Sadagopan, W. Sy, R. Zhang, Y. Chen and M. Han, Qualcomm, Inc., San Diego, CA