

# 2002 Microwave Symposium Technical Program Schedule



## Session WE1A High Power Amplifiers WATTS UP?

8:00–9:40 am

Room 608–609

Wednesday, June 5, 2002

Chair: K. Ikossi, NRL

Co-Chair: J. Komiak, BAE SYSTEMS

<b>WE1A-1</b> 8:00 am	<b>A 20W 2080–2200 MHz Hybrid Power Amplifier Optimized for Error Amplifier Applications</b> E.J. Crescenczi, Jr.	613
<b>WE1A-2</b> 8:20 am	<b>A 15 Watt PEP GaAs PHEMT MMIC Power Amplifier for 3G Wireless Transmitter Applications</b> J. Staudinger, R. Sherman, T. Quach, M. Miller, and L. Frye	617
<b>WE1A-3</b> 8:40 am	<b>70% High Efficient C-Band 27W Hetero-Structure FET for Space Application</b> H. Minamide, M. Kohno, N. Yoshida, K. Yajima, K. Mori, T. Ogata, and T. Sonoda	621
<b>WE1A-4</b> 9:00 am	<b>Ka-Band Coupled-Cavity TWT Amplifiers for Military Radar and Commercial Satellite Communication</b> J.R. Legarra, P.E. Kolda, H.P. Freund, T.M. Antonsen, Jr., and B. Levush	625
<b>WE1A-5</b> 9:10 am	<b>High Performance Microwave Power Modules for Military and Commercial Systems</b> M. Basten, D. Whaley, J. Duthie, V. Heinen, K. Kreischer, J. Tucek, A. Ferek, F. Trimble, and B. Gannon	629
<b>WE1A-6</b> 9:30 am	<b>Production and Operation of a High-Efficiency DBS-Band Klystron Utilizing a Multistage Depressed Collector</b> T. Habermann, R. Batra, R. Begum, E.W. McCune, and E.L. Wright	633

## Session WE1B

# Microwave and Millimeter-Wave Sensor Applications

8:00–9:40 am

Room 606–607

Wednesday, June 5, 2002

Chair: P. Staecker, Photonic Systems, Inc.  
Co-Chair: R. Sparks, ANRO Engineering, Inc.

<b>WE1B-1</b> 8:00 am	<b>Development of RF Carbon Nanotube Resonant Circuit Sensors for Gas Remote Sensing Applications</b> S. Chopra, A. Pham, J. Gaillard, and A.M. Rao	639
<b>WE1B-2</b> 8:20 am	<b>Integrated Microwave Sensor for Cavity-Length Measurement with Sub-Millimeter Accuracy</b> A. Megej, K. Beilenhoff, M. Schüßler, A. Ziroff, B. Mottet, O. Yilmazoglu, K. Mutamba, C.D. Hamann, R. Baican, and H.L. Hartnagel	643
<b>WE1B-3</b> 8:40 am	<b>A Planar Resonant Sensor for the Complex Permittivity Characterization of Materials</b> E. Fratticcioli, M. Dionigi, and R. Sorrentino	647
<b>WE1B-4</b> 8:50 am	<b>Microwave Reflection Tomography Array for Damage Detection in Concrete Structures</b> Y.J. Kim, L. Jofre, F. De Flaviis, and M.Q. Feng	651
<b>WE1B-5</b> 9:10 am	<b>Wireless IDT Ice Sensor</b> K.A. Jose, G. Sunil, V.K. Varadan, and V.V. Varadan	655

## Session WE1C

# Transmission Line Structures

8:00–9:40 am

Room 611–612

Wednesday, June 5, 2002

Chair: G.E. Ponchak, NASA Glenn Research Center  
Co-Chair: E. Denlinger, Sarnoff Corporation

<b>WE1C-1</b> 8:00 am	<b>High Performance Air Gap Transmission Lines for Millimeter Wave Applications</b> I. Jeong, S.-H. Shin, J.-H. Go, J.-S. Lee, C.-M. Nam, D.-W. Kim, and Y.-S. Kwon	661
<b>WE1C-2</b> 8:20 am	<b>Reconfigurable Quasi-Fractal Transmission Line Structures</b> J. Sor, Y. Wang, and T. Itoh	665
<b>WE1C-3</b> 8:30 am	<b>Miniaturized Slow-Wave Coplanar Waveguide Circuits on High-Resistivity Silicon</b> J. Naylor, T. Weller, J. Culver, and M. Smith	669
<b>WE1C-4</b> 8:40 am	<b>Modeling of Real-Shaped LTCC Stripline Structure Having Sharpened Edges and Embedded Pores</b> J.H. Jang, N. Ishitobi, and C.H. Kim	673
<b>WE1C-5</b> 8:50 am	<b>High-Isolation Bonding Pad with Depletion-Insulation Structure for RF/Microwave Integrated Circuits on Bulk Silicon CMOS</b> S. Lam, W.H. Ki, and M. Chan	677
<b>WE1C-6</b> 9:00 am	<b>Porosity Effects on Coplanar Waveguide Porous Silicon Interconnects</b> I.K. Itotia and R.F. Drayton	681
<b>WE1C-7</b> 9:10 am	<b>Substrate Loss Mechanisms for Microstrip and CPW Transmission Lines on Lossy Silicon Wafers</b> D. Lederer and J.-P. Raskin	685

## Session WE1D



# Advances in Microwave Oscillators

8:00–9:40 am

Room 615–6–7

Wednesday, June 5, 2002

Chair: J. Papapolymerou, Georgia Institute of Technology  
Co-Chair: S. Wetenkamp, SCEAN

<b>WE1D-1</b>	<b>Ultra Low Phase Noise SiGe HBT Application to a C Band Sapphire Resonator Oscillator</b>	691			
8:00 am	G. Cibiel, M. Régis, O. Llopis, Y. Kersalé, V. Giordano, H. Lafontaine, R. Plana, and M. Chaubet				
<b>WE1D-2</b>	<b>A Low Phase Noise Silicon 9 GHz VCO and an 18 GHz Push-Push Oscillator</b>	695			
8:20 am	L. Dussopt, D. Guillois, and G.M. Rebeiz				
<b>WE1D-3</b>	<b>A Novel Microwave Oscillator Using Double-Sided MIC</b>	699	<table border="1" style="border-collapse: collapse; width: 20px; height: 20px;"> <tr><td style="text-align: center;">WE</td></tr> <tr><td style="text-align: center;">1F</td></tr> </table>	WE	1F
WE					
1F					
8:40 am	K. Kawahata, N. Miyayoshi, and M. Aikawa				
<b>WE1D-4</b>	<b>C-Band Oscillator Using High-Q Inductors Embedded in Multi-Layer Organic Packaging</b>	703	<table border="1" style="border-collapse: collapse; width: 20px; height: 20px;"> <tr><td style="text-align: center;">WE</td></tr> <tr><td style="text-align: center;">2A</td></tr> </table>	WE	2A
WE					
2A					
8:50 am	S.-W. Yoon, M.F. Davis, K. Lim, S. Pinel, M. Maeng, C.-H. Lee, S. Chakraborty, S. Mekela, J. Laskar, G. White, and R. Tummala				
<b>WE1D-5</b>	<b>A Differentially-Tuned CMOS LC VCO for Low-Voltage Full-Rate 10 Gb/s CDR Circuit</b>	707			
9:10 am	D. Mukherjee, J. Bhattacharjee, and J. Laskar				

## Session WE1E

# Linear Modeling

8:00–9:40 am

Room 602–3–4

Wednesday, June 5, 2002

Chair: M. Nakhla, Carleton University  
Co-Chair: W. Struble, M/ACOM

<b>WE1E-1</b>	<b>Implicit Space Mapping EM-Based Modeling and Design Exploiting Preassigned Parameters</b>	713	
8:00 am	J.W. Bandler, Q. Cheng, N. Georgieva, and M.A. Ismail		
<b>WE1E-2</b>	<b>Wide-Band Compact Modeling of Spiral Inductors in RFICs</b>	717	
8:20 am	D. Melendy, P. Francis, C. Pichler, K. Hwang, G. Srinivasan, and A. Weisshaar		
<b>WE1E-3</b>	<b>On the Synthesis of Equivalent Circuit Models for Multiports Characterized by Frequency-Dependent Parameters</b>	721	
8:40 am	R. Neumayer, F. Haslinger, A. Stelzer, and R. Weigel		
<b>WE1E-4</b>	<b>New Extraction Algorithm for GaAs-HBTs with Low Intrinsic Base Resistance</b>	725	
8:50 am	F. Lenk and M. Rudolph		
<b>WE1E-5</b>	<b>Uncertainty Estimation and Optimal Extraction of Intrinsic FET Small Signal Model Parameters</b>	729	
9:10 am	C. Fager, P. Linnér, and J.C. Pedro		
<b>WE1E-6</b>	<b>An Analytic Expression for the HBT Extrinsic Base-Collector Capacitance Derived from S-Parameter Measurements</b>	733	
9:30 am	E. Wasige, B. Sheinman, V. Sidorov, S. Cohen, and D. Ritter		

## Session WE1F

# Advances in Time-Domain Techniques for EM Field Modeling

8:00–9:40 am

Room 613–614

Wednesday, June 5, 2002

Chair: P. Russer, Institute for High Frequency Engineering, Technical University of Munich, Germany

Co-Chair: A. Beyer, Institute of Electrical Engineering, University of Duisburg, Germany

<b>WE1F-1</b> 8:00 am	<b>Enhanced PML-Like ABCs for Layered Media Transmission Line Termination</b> A. Lauer, A. Wien, P. Waldow, and I. Wolff	739
<b>WE1F-2</b> 8:10 am	<b>Global Modeling of Active Microwave Devices Incorporating a Novel Large-Signal Time-Domain Full-Hydrodynamic Physical Simulator Using Wavelet-Based Adaptive Grids</b> Y.A. Hussein and S.M. El-Chazaly	743
<b>WE1F-3</b> 8:30 am	<b>Coupling Front Tracking and Wavelet Techniques for Fast Time Domain Simulations</b> C.D. Sarris and L.P.B. Katehi	747
<b>WE1F-4</b> 8:50 am	<b>Demonstration and Suppression of Numerical Divergence Errors in FDTD Analysis of Practical Microwave Problems</b> M. Celuch-Marcysiak	751
<b>WE1F-5</b> 9:10 am	<b>Analysis of Guided Wave Structures Using 3-D Envelope-Finite Element (EVFE) Technique</b> H.-P. Tsai, Y. Wang, and T. Itoh	755
<b>WE1F-6</b> 9:30 am	<b>A Surface Impedance Approach for Modeling Multilayer Conductors in FDTD</b> W. Thiel and L.P.B. Katehi	759

## Session WE2A

# Distortion Correction Techniques for High Power Amplifiers

10:10–11:50 am

Room 608–609

Wednesday, June 5, 2002

Chair: A. Katz, The College of New Jersey

Co-Chair: J. Goel, S & E G/TRW

<b>WE2A-1</b> 10:10 am	<b>Power Amplifier Module with Digital Adaptive Predistortion for Cellular Phone</b> S. Kusunoki, K. Yamamoto, T. Hatsugai, K. Tagami, H. Nagaoka, N. Tominaga, K. Osawa, K. Tanabe, S. Sakurai, and T. Iida	765
<b>WE2A-2</b> 10:30 am	<b>Feedforward Amplifier for WCDMA Base Stations with a New Adaptive Control Method</b> Y.Y. Woo, Y. Yang, J. Yi, J. Nam, J.H. Cha, and B. Kim	769
<b>WE2A-3</b> 10:50 am	<b>A Novel Technology for Linearizing Traveling Wave Tube Amplifiers</b> T. Chen, Y. Goren, C. Jensen, P. Lally, and D. Gagne	773
<b>WE2A-4</b> 11:10 am	<b>New Linearization Method for the Modulated Signals with High Peak-to-Average Ratio: Peak-to-Average Ratio Reduction and Expansion</b> Y. Yang, Y.Y. Woo, J. Cha, J. Yi, and B. Kim	777
<b>WE2S-5</b> 11:30 am	<b>Reduction of Intermodulation Distortion in Active Phased Array Antenna Systems Using a Distortion Controller</b> T. Kaho, T. Nakagawa, and K. Araki	781

## Session WE2B

# Evolving Communication and Radar Systems

10:10–11:50 am

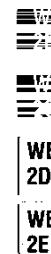
Room 606–607

Wednesday, June 5, 2002

Chair: R.H. Knoechel, University of Kiel

Co-Chair: K. Breuer, BAE Systems

<b>WE2B-1</b>	<b>A Compact Ka-Band 156 Mbps Transceiver for a Wireless LAN System Using PTFE/FR-4 Laminated MCMs</b>	<b>787</b>
10:10 am	K. Takahashi, S. Fujita, M. Inoue, G. Wu, and H. Yabuki	
<b>WE2B-2</b>	<b>An Obstacle Sensing Radar System for a Railway Crossing Application: A 60GHz Millimeter Wave Spread Spectrum Radar</b>	<b>791</b>
10:30 am	M. Watanabe, K. Okazaki, T. Fukae, N. Tamiya, N. Ueda, and M. Nagashima	
<b>WE2B-3</b>	<b>Highly Integrated Microwave Point-to-Point Outdoor Unit Optimized for Ultra High Volume Manufacturing</b>	<b>795</b>
10:50 am	J.T. Louhi, H. Somerma, K. Nikkanen, M. Koivisto, N. Nordman, T. Tuoriniemi, M. Hirvilampi, M. Pehkonen, K. Vepsäläinen, P. Bergholm, P. Ruhanen, M. Platan, J. Rantiala, P. Mikkonen, and J. Mäkinen	
<b>WE2B-4</b>	<b>Architecture and Algorithm for High Precision Image Rejection and Spurious Rejection Mixers Using Digital Compensation</b>	<b>799</b>
11:10 am	Y. Kim, S. Shin, and K. Lee	
<b>WE2B-5</b>	<b>Power-Amplifier Transient Tracking in OFDM</b>	<b>803</b>
11:30 am	D. Bateman, S. Simoens, M. de Courville, and G. Julien	



## Session WE2C

# Transitions, Polarizers, and Coupling Characteristics in LTCC

10:10–11:50 am

Room 611–612

Wednesday, June 5, 2002

Chair: M. Dydyk, Motorola

Co-Chair: K. Wu

<b>WE2C-1</b>	<b>Analysis and Synthesis of In-Line Coaxial-to-Waveguide Adapters</b>	<b>809</b>
10:10 am	R. Levy and L.W. Hendrick	
<b>WE2C-2</b>	<b>A Transition from Microstrip to Dielectric-Filled Rectangular Waveguide in Surface Mounting</b>	<b>813</b>
10:30 am	K. Sano and T. Yoneyama	
<b>WE2C-3</b>	<b>A Millimeter-Wave Perpendicular Coax-to-Microstrip Transition</b>	<b>817</b>
10:40 am	M. Morgan and S. Weinreb	
<b>WE2C-4</b>	<b>Mono-Grooved Circular Waveguide Polarizers</b>	<b>821</b>
10:50 am	N. Yoneda, M. Miyazaki, T. Horie, and H. Satou	
<b>WE2C-5</b>	<b>Analysis of Coupling Characteristics Between Transmission Lines with a Buried Meshed-Ground in LTCC-MCMs</b>	<b>825</b>
11:10 am	J.-G. Kim, E.-T. Lee, D.-H. Kim, J.-H. Lee, S.-Y. Lee, H.-S. Kim, J.-S. Park, and C.-Y. Cheon	

## Session WE2D

# Microwave and Millimeter Wave Signal Generation

10:10–11:50 am

Room 615–6–7

Wednesday, June 5, 2002

Chair: P. Khanna, Agilent Technologies

Co-Chair: D. Elad, Rastech

<b>WE2D-1</b>	<b>45 GHz Highly Integrated Phase-Locked Loop Frequency Synthesizer in SiGe Bipolar Technology</b>	<b>831</b>
10:10 am	G. Ritzberger, J. Böck, and A.L. Scholtz	
<b>WE2D-2</b>	<b>Single-Chip 20-GHz VCO and Frequency Divider in SiGe Technology</b>	<b>835</b>
10:30 am	K. Ettinger, A. Stelzer, C.G. Diskus, W. Thomann, J. Fenk, and R. Weigel	
<b>WE2D-3</b>	<b>38 GHz Push-Push GaAs-HBT MMIC Oscillator</b>	<b>839</b>
10:50 am	M. Schott, H. Kuhnert, F. Lenk, J. Hilsenbeck, J. Würfl, and W. Heinrich	
<b>WE2D-4</b>	<b>A 40 GHz-Band Fully Monolithic VCO with a One-Wave Length Microstrip Resonator for Accurate Oscillation Frequency</b>	<b>843</b>
11:00 am	H. Ikematsu, K. Kawakami, T. Katoh, and K. Itoh	
<b>WE2D-5</b>	<b>A Ku Band InGaP/GaAs HBT MMIC VCO with a Balanced and a Differential Topologies</b>	<b>847</b>
11:20 am	D.-H. Baek, J.-G. Kim, and S. Hong	

## Session WE2E

# Nonlinear Device Modeling I

10:10–11:50 am

Room 602–3–4

Wednesday, June 5, 2002

Chair: B. Pejcinovic

Co-Chair: S. Goodnick, Arizona State University

<b>WE2E-1</b>	<b>A New Behavioral Model Taking into Account Nonlinear Memory Effects and Transient Behaviors in Wideband SSPAs</b>	<b>853</b>
10:10 am	A. Soury, E. Ngoya, and J.M. Nebus	
<b>WE2E-2</b>	<b>Accurate Prediction of PHEMT Intermodulation Distortion Using the Nonlinear Discrete Convolution Model</b>	<b>857</b>
10:30 am	A. Costantini, R.P. Paganelli, P.A. Traverso, D. Argento, G. Favre, M. Pagani, A. Santarelli, G. Vannini, and F. Filicori	
<b>WE2E-3</b>	<b>An Electrothermal BSIM3 Model for Large-Signal Operation of RF Power LD MOS Devices</b>	<b>861</b>
10:50 am	O. Tornblad and C. Blair	
<b>WE2E-4</b>	<b>Nonlinear Amplifier Modeling Taking into Account HF Memory Frequency</b>	<b>865</b>
11:10 am	F. Launay, Y. Wang, S. Toutain, D. Barataud, JM. Nebus, and R. Quere	

# Session WE2F

## Applications of the Finite-Difference Time-Domain Method

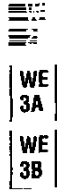
10:10–11:50 am

Room 613–614

Wednesday, June 5, 2002

Chair: E.M. Tentzeris, School of ECE, Georgia Institute of Technology, USA  
Co-Chair: L. Roselli, Department of Electronics and Information Engineering,  
University of Perugia, Italy

<b>WE2F-1</b>	<b>Equivalent Circuit of Radiating Longitudinal Slots in Dielectric Filled Rectangular Waveguides Obtained with FDTD Method</b>	<b>871</b>
<b>10:10 am</b>	R.V. Gatti, R. Sorrentino, and M. Dionigi	
<b>WE2F-2</b>	<b>Custom Hardware Implementation of the Finite-Difference Time-Domain (FDTD) Method</b>	<b>875</b>
<b>10:20 am</b>	R.N. Schneider, M.M. Okoniewski, and L.E. Turner	
<b>WE2F-3</b>	<b>Analysis of CMOS Interconnections Combining LE-FDTD Method and SOC Procedure</b>	<b>879</b>
<b>10:40 am</b>	F. Alimenti, V. Palazzari, P. Placidi, G. Stopponi, A. Scorzoni, and L. Roselli	
<b>WE2F-4</b>	<b>Modeling and Optimization of RF Reconfigurable Tuners with Computationally Efficient Time-Domain Techniques</b>	<b>883</b>
<b>11:00 am</b>	N. Bushyager, K. Lange, M. Tentzeris, and J. Papapolymerou	
<b>WE2F-5</b>	<b>Application of C-COM for Microwave Integrated-Circuit Modeling</b>	<b>887</b>
<b>11:20 am</b>	K. Lan, S.K. Chaudhuri, and S. Safavi-Naeini	
<b>WE2F-6</b>	<b>Comparison of the Efficiency of Electromagnetic Solvers in the Time- and Frequency-Domain for the Accurate Modeling of Planar Circuits and MEMS</b>	<b>891</b>
<b>11:30 am</b>	L. Pierantoni, M. Farina, T. Rozzi, F. Coccetti, W. Dressel, and P. Russer	



## Session WE3A

# Power Amplifier Technologies for Broadband, High Efficiency Applications

1:20–3:00 pm

Room 608–609

Wednesday, June 5, 2002

Chair: A. Platzker, Raytheon

Co-Chair: P. Asbeck, UCSD

<b>WE3A-1</b>	<b>A 6 Watt LDMOS Broadband High Efficiency Distributed Power Amplifier Fabricated Using LTCC Technology</b>	<b>897</b>
1:20 pm	L. Zhao, A. Pavio, B. Stengel, and B. Thompson	
<b>WE3A-2</b>	<b>Optimum Bias Conditions for Linear Broadband InGaP/GaAs HBT Power Amplifiers</b>	<b>901</b>
1:40 pm	M. Iwamoto, C.P. Hutchinson, J.B. Scott, T.S. Low, M. Vaidyanathan, P.M. Asbeck, and D.C. D'Avanzo	
<b>WE3A-3</b>	<b>High Efficiency Wideband 6 to 18 GHz PHEMT Power Amplifier MMIC</b>	<b>905</b>
2:00 pm	J.J. Komiak, W. Kong, and K. Nichols	
<b>WE3A-4</b>	<b>A Broadband, Push-Pull Power MMIC Operating at K/Ka-Band Frequencies</b>	<b>909</b>
2:10 pm	J.M. Schellenberg	
<b>WE3A-5</b>	<b>A New Amplifier Power Combining Scheme with Optimum Efficiency Under Variable Outputs</b>	<b>913</b>
2:30 pm	C.Y. Hang, Y. Wang, and T. Itoh	
<b>WE3A-6</b>	<b>W-Band InP/InGaAs/InP DHBT MMIC Power Amplifiers</b>	<b>917</b>
2:40 pm	Y. Wei, S. Lee, K. Sundararajan, M. Dahlstrom, M. Urteaga, and M. Rodwell	
<b>WE3A-7</b>	<b>RF Performance and Thermal Analysis of AlGaIn/GaN Power HEMTs in Presence of Self-Heating Effects</b>	<b>921</b>
2:50 pm	S. Nuttinck, E. Gebara, J. Laskar, B. Wagner, and M. Harris	

## Session WE3B

# Direct Conversion Techniques for Wireless Systems

1:20–3:00 pm

Room 606–607

Wednesday, June 5, 2002

Chair: S.D. Pritchett, Texas Instruments Incorporated

Co-Chair: S.L. March, Texas Instruments Incorporated

<b>WE3B-1</b>	<b>A 0.9–2.6 GHz Broadband RF Front-End for Direct Conversion Transceivers</b>	<b>927</b>
1:20 pm	M. Kawashima, H. Hayashi, T. Nakagawa, K. Nishikawa, and K. Araki	
<b>WE3B-2</b>	<b>Six-Port Direct Digital Receiver (SPDR) and Standard Direct Receiver (SDR) Results for QPSK Modulation at High Speeds</b>	<b>931</b>
1:40 pm	J.-C. Schiel, S.O. Tatu, K. Wu, and R.G. Bosisio	
<b>WE3B-3</b>	<b>Development of a Low-IF Receiver and a Fixed Wireless Utility Network</b>	<b>935</b>
2:00 pm	S. Thumaty, A. Pham, and H. van Wyk	
<b>WE3B-4</b>	<b>A Microwave Communication Link with Self-Heterodyne Direct Down Conversion and System Predistortion</b>	<b>939</b>
2:20 pm	J. Park, Y. Wang, and T. Itoh	



## Session WE3C

# New Leakage Effects on Printed-Circuit Transmission Lines

1:20–3:00 pm

Room 611–612

Wednesday, June 5, 2002

Chair: J. Zehentner, Czech Technical University  
Co-Chair: H. Shigesawa, Doshisha University

<b>WE3C-1</b>	<b>The Danger of High-Frequency Spurious Effects on Wide Microstrip Line</b>	<b>945</b>
1:20 pm	F. Mesa and D.R. Jackson	
<b>WE3C-2</b>	<b>Frequency Dependent Characteristics of Radiation from a Voltage Source on a Covered Microstrip Line</b>	<b>949</b>
1:40 pm	W.L. Langston, J.T. Williams, D.R. Jackson, and F. Mesa	
<b>WE3C-3</b>	<b>Approximate Analytical Evaluation of the Continuous Spectrum in a Substrate-Superstrate Dielectric Waveguide</b>	<b>953</b>
2:00 pm	P. Baccarelli, P. Burghignoli, F. Frezza, A. Galli, G. Lovat, and D.R. Jackson	
<b>WE3C-4</b>	<b>Significant Contribution of Nonphysical Leaky Mode to the Fields Excited by a Practical Source in Printed-Circuit Transmission Lines</b>	<b>957</b>
2:20 pm	M. Tsuji, S. Ueki, and H. Shigesawa	
<b>WE3C-5</b>	<b>Novel Selected Modes on the Conductor-Backed Slotline</b>	<b>961</b>
2:40 pm	J. Zehentner, J. Machac, and J. Mrkvica	

## Session WE3D

# Efficient Modeling Techniques for Circuit Simulation

1:20–3:00 pm

Room 615–6–7

Wednesday, June 5, 2002

Chair: A.K. Sharma, TRW  
Co-Chair: R. Goyal, TeleVersal Systems, Inc.

<b>WE3D-1</b>	<b>A Symmetry Device to Speed Up Circuit Simulation and Stability Tests</b>	<b>967</b>
1:20 pm	S. Ramberger and T. Merkle	
<b>WE3D-2</b>	<b>Feasible Adjoint Sensitivity Technique for EM Design Optimization</b>	<b>971</b>
1:40 pm	N.K. Georgieva, S. Glavic, M.H. Bakr, and J.W. Bandler	
<b>WE3D-3</b>	<b>On Passive Time-Domain Macromodels of Distributed Transmission Line Networks</b>	<b>975</b>
2:00 pm	A. Dounavis, R. Achar, and M. Nakhla	
<b>WE3D-4</b>	<b>Fast and Accurate C.A.D. of Narrow Band Waveguide Filters Applying an Electromagnetic Segmentation Method</b>	<b>979</b>
2:20 pm	D. Bariant, S. Bila, D. Baillargeat, S. Verdeyme, and P. Guillon	
<b>WE3D-5</b>	<b>Coupling of Large Number of Vias in Electronic Packaging Structures and Differential Signaling</b>	<b>983</b>
2:40 pm	H. Chen, Q. Li, L. Tsang, and V. Jandhyala	
<b>WE3D-6</b>	<b>Full Wave Analysis of Isolated Pockets to Improve Isolation Performances in Silicon Based Technology</b>	<b>987</b>
2:50 pm	D. Bajon, S. Wane, H. Baudrand, and P. Gamand	



## Session WE3E

### Nonlinear Device Modeling II

1:20–3:00 pm

Room 602–3–4

Wednesday, June 5, 2002

Chair: S.K. Rockwell, Motorola

Co-Chair: G.F. Manes, University of Florence

<b>WE3E-1</b> 1:20 pm	<b>Novel Technique for Determining Bias, Temperature and Frequency Dependence of FET Characteristics</b> A.E. Parker and J.G. Rathmell	993
<b>WE3E-2</b> 1:40 pm	<b>Towards a Unified Method to Implement Transit-Time Effects in Pi-Topology HBT Compact Models</b> M. Rudolph, F. Lenk, R. Doerner, and P. Heymann	997
<b>WE3E-3</b> 2:00 pm	<b>Measurement and Modelling of Static and Dynamic Breakdowns of Power GaInP/GaAs HBTs</b> S. Heckmann, J.-M. Nébus, R. Quéré, J.-C. Jacquet, D. Floriot, and P. Auxemery	1001
<b>WE3E-4</b> 2:20 pm	<b>A Simple Practical Technique for Estimating the Junction Temperature and the Thermal Resistance of a GaAs HBT</b> M. Olavsbråten	1005
<b>WE3E-5</b> 2:40 pm	<b>A Novel Extraction Method for a Fully Electro-Thermal Large-Signal Model of HBT</b> H.-M. Park, R. Green, and S. Hong	1009

## Session WE4A

### RF Power Amplifiers for Wireless Applications

3:30–5:10 pm

Room 608–609

Wednesday, June 5, 2002

Chair: C.E. Weitzel, Motorola, Inc.

Co-Chair: A. Pham, Clemson University

<b>WE4A-1</b> 3:30 pm	<b>High Performance Silicon Bipolar Power Amplifier for 1.8 GHz Applications</b> F. Carrara, A. Castorina, A. Scuderi, and G. Palmisano	1015
<b>WE4A-2</b> 3:50 pm	<b>A 2.4 GHz High Efficiency SiGe HBT Power Amplifier with High-Q LTCC Harmonic Suppression Filter</b> A. Raghavan, D. Heo, M. Maeng, A. Sutono, K. Lim, and J. Laskar	1019
<b>WE4A-3</b> 4:10 pm	<b>The Maximum Operating Region in SiGe HBTs for Rf Power Amplifiers</b> A. Inoue, S. Nakatsuka, R. Hattori, and Y. Matsuda	1023
<b>WE4A-4</b> 4:20 pm	<b>Implementation of RF Power MOS in 0.18<math>\mu</math>m CMOS Technology for Single Chip Solution</b> H.-M. Hsu, C.-W. Chen, J.-G. Su, T.-H. Yeh, J.C.-H. Lin, J.Y.-C. Sun, and C.H. Chen	1027
<b>WE4A-5</b> 4:40 pm	<b>Performance of GaAs on Silicon Power Amplifier for Wireless Handset Applications</b> N. Escalera, R. Errick, S. Franson, B. Farber, G. Garrison, J. Holmes, S. Rockwell, and B. Bosco	1031
<b>WE4A-6</b> 4:50 pm	<b>Broadband High-Efficiency Monolithic InGaP/GaAs HBT Power Amplifiers for 3G Handset Applications</b> H. Jäger, A. Grebennikov, E. Heaney, and R. Weigel	1035
<b>WE4A-7</b> 5:00 pm	<b>InGaP PHEMTs for 3.5GHz W-CDMA Applications</b> E. Lan, E. Johnson, B. Knappenberger, and M. Miller	1039

## Session WE4B

# New Technologies for Communications Systems

3:30–5:10 pm

Room 606–607

Wednesday, June 5, 2002

Chair: J. Sitch, Nortel Networks

Co-Chair: J.B. Horton, J.B. Horton Group

<b>WE4B-1</b>	<b>Broadband Highly Integrated LTCC Front-End Module for IEEE 802.11a WLAN Applications</b>	<b>1045</b>
3:30 pm	C.-H. Lee, S. Chakraborty, A. Sutono, S. Yoo, D. Heo, and J. Laskar	
<b>WE4B-2</b>	<b>DCS1800 Base Station Receiver Integrated in 0.25<math>\mu</math>m CMOS</b>	<b>1049</b>
3:50 pm	O. Boric-Lubecke, J. Lin, and P. Gould	
<b>WE4B-3</b>	<b>Development of SOI Based MMICs for Wireless LAN Applications</b>	<b>1053</b>
4:10 pm	S. Pinel, S. Chakraborty, S. Venkataraman, R. Bhatia, S. Mandal, S. Nuttinck, B. Larson, and J. Laskar	
<b>WE4B-4</b>	<b>Design of High Speed Master-Slave D-Type Flip-Flop in InP DHBT Technology</b>	<b>1057</b>
4:30 pm	A.-E. Kasbari, P. André, A. Konczykowska, M. Riet, S. Blayac, H. Ouslimani, and J. Godin	
<b>WE4B-5</b>	<b>A GaAs MHEMT Distributed Amplifier with 300-GHz Gain-Bandwidth Product for 40-Gb/s Optical Applications</b>	<b>1061</b>
4:50 pm	M.S. Heins, C.F. Campbell, M.-Y. Kao, M.E. Muir, and J.M. Carroll	

## WE4C

# New Periodic Structures and Effects

3:30–5:10 pm

Room 611–612

Wednesday, June 5, 2002

Chair: A. Omar, University of Magdeburg

Co-Chair: D.R. Jackson, University of Houston

<b>WE4C-1</b>	<b>Negative Refractive Index Metamaterials Supporting 2-D Waves</b>	<b>1067</b>
3:30 pm	A.K. Iyer and G.V. Eleftheriades	
<b>WE4C-2</b>	<b>Characteristics of Ka Band Waveguide Using Electromagnetic Crystal Sidewalls</b>	<b>1071</b>
3:50 pm	J.A. Higgins, H. Xin, and A. Sailer	
<b>WE4C-3</b>	<b>Terahertz Pulse Propagation in Plastic Photonic Crystal Fibers</b>	<b>1075</b>
4:00 pm	H. Han, H. Park, M. Cho, J. Kim, I. Park, and H. Lim	
<b>WE4C-4</b>	<b>Radiation from Ground-Plane Photonic Bandgap Microstrip Waveguides</b>	<b>1079</b>
4:10 pm	N. Shino and Z. Popovic	
<b>WE4C-5</b>	<b>Dispersion Characteristics of EME Microstrip at First Higher Order</b>	<b>1083</b>
4:30 pm	C.-K. Wu, Y.-C. Chen, and C.-K.C. Tzuang	
<b>WE4C-6</b>	<b>PBG-Enhanced Inductor</b>	<b>1087</b>
4:40 pm	H.-S. Wu and C.-K.C. Tzuang	
<b>WE4C-7</b>	<b>Reduced Size Capacitive Defect EBG Resonators</b>	<b>1091</b>
4:50 pm	X. Gong, W.J. Chappell, and L.P.B. Katehi	



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## WE4D

# CAD Techniques Using Computational Intelligence

3:30–5:10 pm

Room 615–6–7

Wednesday, June 5, 2002

Chair: K.C. Gupta, University of Colorado at Boulder

Co-Chair: Q.J. Zhang, Carleton University

<b>WE4D-1</b> 3:30 pm	<b>Advanced Microwave Modeling Framework Exploiting Automatic Model Generation, Knowledge Neural Networks and Space Mapping</b> V. Devabhaktuni, B. Chattaraj, M.C.E. Yagoub, and Q.J. Zhang	1097
<b>WE4D-2</b> 3:50 pm	<b>Neural Based Dynamic Modeling of Nonlinear Microwave Circuits</b> J. Xu, M.C.E. Yagoub, R. Ding, and Q.J. Zhang	1101
<b>WE4D-3</b> 4:10 pm	<b>A Systematic Approach to a Reliable Neural Model for pHEMT Using Different Numbers of Training Data</b> M. Joodaki and G. Kompa	1105
<b>WE4D-4</b> 4:20 pm	<b>A Novel Design Approach for Microwave Planar Filters</b> S.F. Peik and R.R. Mansour	1109
<b>WE4D-5</b> 4:30 pm	<b>EM-Simulator Based Parameter Extraction and Optimization Technique for Microwave and Millimeter Wave Filters</b> P. Harscher, E. Ofij, R. Vahldieck, and S. Amari	1113
<b>WE4D-6</b> 4:50 pm	<b>Computer-Aided Tuning of Microwave Filters Using Fuzzy Logic</b> V. Mirafteb and R.R. Mansour	1117

## Session WE4E

# Applications of Time Domain Methods

3:30–5:10 pm

Room 602–3–4

Wednesday, June 5, 2002

Chair: S. El-Ghazaly, Department of Electrical Engineering, Arizona State University, USA

Co-Chair: W. Gwarek, Warsaw University of Technology, Poland

<b>WE4E-1</b> 3:30 pm	<b>A General Framework for SPICE-TLM Interconnection</b> P.P.M. So and W.J.R. Hofer	1123
<b>WE4E-2</b> 3:50 pm	<b>FDTD Study of Surface Waves in Microstrip and Patch Structures</b> E. Semouchkina, G. Semouchkin, W. Cao, and R. Mittra	1127
<b>WE4E-3</b> 4:10 pm	<b>Time Domain Field Synthesis with 3D Symmetric Condensed Node TLM</b> M.H. Bakr, P.P.M. So, and W.J.R. Hofer	1131
<b>WE4E-4</b> 4:30 pm	<b>Towards Accurate Time-Domain Simulation of Highly Conductive Materials</b> C. Yuan and Z. Chen	1135
<b>WE4E-5</b> 4:40 pm	<b>Lumped Device Modeling with FDTD Including Packaging Effects</b> B.P. Koh, I.J. Craddock, P. Urwin-Wright, and C.J. Railton	1139
<b>WE4E-6</b> 4:50 pm	<b>A New 2-D Image Reconstruction Algorithm Based on FDTD and Design Sensitivity Analysis</b> N.-W. Kang, Y.-S. Chung, C. Cheon, and H.-K. Jung	1143

# Session IF-WE

## Wednesday Interactive Forum

1:30–4:30 pm

Room 6E

Wednesday, June 5, 2002

Chair: R. Hamilton, TriQuint Semiconductor

IF-WE-01 1:30 pm	<b>Measurements on Dielectric and Radiation Loss of Flexible Circular Dielectric Waveguides in Q-Band</b> K.Y. Kim, J.R. Sohn, H.J. Seo, J.-W. Han, H.-S. Tae, and J.-H. Lee	1149
IF-WE-02 1:30 pm	<b>A Technique for Reducing the Size of Amplifiers Using Defected Ground Structure</b> J.-S. Lim, Y.-T. Lee, J.-H. Han, J.-S. Park, D. Ahn, and S. Nam	1153
IF-WE-03 1:30 pm	<b>A New Sandwich Structure of Photonic Bandgap</b> Y. Pang and B. Gao	1157
IF-WE-04 1:30 pm	<b>Amplifier Design Using <math>\lambda/4</math> High Impedance Bias Line with Defect Ground Structure (DGS)</b> S.-G. Jeong, D.-K. Hwang, Y.-C. Jeong, and C.-D. Kim	1161
IF-WE-05 1:30 pm	<b>A Derivation of a Class of 3-Port Baluns from Symmetrical 4-Port Networks</b> Y.C. Leong, K.S. Ang, and C.H. Lee	1165
IF-WE-06 1:30 pm	<b>An Inverted Coplanar Coupler with Integral Microstrip Interfaces and Bias Crossover</b> E.J. Crescenzi, Jr.	1169
IF-WE-07 1:30 pm	<b>Dividing and Filtering Function Integration for the Development of a Band-Pass Filtering Power Amplifier</b> S. Avrillon, A. Chousseaud, and S. Toutain	1173
IF-WE-08 1:30 pm	<b>Design Method of a Dual Band Balun and Divider</b> J.-H. Sung, G.-Y. Kim, S.-H. Son, H.-J. Lee, Y.-J. Song, Y.-W. Jeong, H.-S. Park, and D. Ahn	1177
IF-WE-09 1:30 pm	<b>TFBAR Filters for 2 GHz Wireless Applications</b> K.W. Kim, J.G. Yook, M.G. Gu, W.Y. Song, Y.J. Yoon, and H.K. Park	1181
IF-WE-10 1:30 pm	<b>Ferromagnetic Composite-Based and Magnetically-Tunable Microwave Devices</b> E. Salahun, G. Tanné, P. Quéffélec, P. Gelin, A.-L. Adenot, and O. Acher	1185
IF-WE-11 1:30 pm	<b>Field Distributions in Six-Port Gyroelectric Semiconductor Circulators with Coplanar Waveguide (CPW) Feeders</b> Z.M. Ng, L.E. Davis, and R. Sloan	1189
IF-WE-12	<b>A Novel Microwave Absorber with Surface-Printed Conductive Line Patterns</b> M. Amano and Y. Kotsuka	1193
IF-WE-13 1:30 pm	<b>Design of Narrow-Band Tunable Band-Pass Filters Based on Dual Mode SrTiO<sub>3</sub> Disc Resonators</b> A. Deleniv, A. Eriksson, and S. Gevorgian	1197
IF-WE-14 1:30 pm	<b>Microwave Characterization of Thin Film BST Material Using a Simple Measurement Technique</b> Z. Jin, A. Tombak, J.-P. Maria, B. Boyette, G.T. Stauf, A.I. Kingon, and A. Mortazawi	1201
IF-WE-15 1:30 pm	<b>High-Q Millimeter-Wave MEMS Varactors: Extended Tuning Range and Discrete-Position Designs</b> L. Dussopt and G.M. Rebeiz	1205
IF-WE-16 1:30 pm	<b>Silicon Micromachined RF MEMS Resonators</b> K.M. Strohm, F.J. Schmückle, B. Schauwecker, J.-F. Luy, and W. Heinrich	1209
IF-WE-17 1:30 pm	<b>Gas Damping Model for a RF MEM Switch and its Dynamic Characteristics</b> T. Veijola, T. Tintunen, H. Nieminen, V. Ermolov, and T. Ryhänen	1213
IF-WE-18 1:30 pm	<b>Digital-Type RF MEMS Switched Capacitors</b> J.B. Rizk and G.M. Rebeiz	1217
IF-WE-19 1:30 pm	<b>Series Switch Compatible with CMOS Technology</b> Y. Cai and L.P.B. Katehi	1221

<b>IF-WE-20</b>	<b>Low-Cost Low Actuation Voltage Copper RF MEMS Switches</b>	<b>1225</b>
1:30 pm	D. Balaraman, S.K. Bhattacharya, F. Ayazi, and J. Papapolymerou	
<b>IF-WE-21</b>	<b>Atomic Layer Deposition (ALD) Technology for Reliable RF MEMS</b>	<b>1229</b>
1:30 pm	N. Hoivik, J.W. Elam, S.M. George, K.C. Gupta, V.M. Bright, and Y.C. Lee	
<b>IF-WE-22</b>	<b>Polyimide Film Based RF MEMS Capacitive Switches</b>	<b>1233</b>
1:30 pm	R. Ramadoss, S. Lee, V.M. Bright, Y.C. Lee, and K.C. Gupta	
<b>IF-WE-23</b>	<b>Distributed MEMS Phase Shifters on Silicon Using Tapered Impedance Unit Cells</b>	<b>1237</b>
1:30 pm	B. Lakshminarayanan and T. Weller	
<b>IF-WE-24</b>	<b>40 GHz Monolithic Integrated Mixer in SiGe Bipolar Technology</b>	<b>1241</b>
1:30 pm	S. Hackl, J. Böck, M. Wurzer, and A.L. Scholtz	
<b>IF-WE-25</b>	<b>Designing Reliable High-Power Limiter Circuits with GaAs PIN Diodes</b>	<b>1245</b>
1:30 pm	D.G. Smith, D.D. Heston, J. Heston, B. Heimer, and K. Decker	
<b>IF-WE-26</b>	<b>A 94GHz High Performance Quadruple Subharmonic Mixer MMIC</b>	<b>1249</b>
1:30 pm	K. Kanaya, K. Kawakami, T. Hisaka, T. Ishikawa, and S. Sakamoto	
<b>IF-WE-27</b>	<b>Harmonic Boosting for High Performance Mixers</b>	<b>1253</b>
1:30 pm	S. Chakraborty, C.-L. Lin, B. Matinpour, and J. Laskar	
<b>IF-WE-28</b>	<b>Development of Ku-Band Receiver/Downconverter for Satellite Transponders</b>	<b>1257</b>
1:30 pm	J.-C. Jeong, Y.H. Lim, B.-J. Jang, I.-B. Yom, and S.-P. Lee	
<b>IF-WE-29</b>	<b>The Design of SiGe HBT LNA for IMT-2000 Mobile Application</b>	<b>1261</b>
1:30 pm	J. Lee, G. Lee, G. Niu, J.D. Cressler, J.H. Kim, J.C. Lee, B. Lee, and N.Y. Kim	
<b>IF-WE-30</b>	<b>THz Radiation Using High Power, Microfabricated, Wideband TWTs</b>	<b>1265</b>
1:30 pm	C.L. Kory, J.H. Booske, W.-J. Lee, S. Gallagher, D.W. van der Weide, S. Limbach, and S. Bhattacharjee	
<b>IF-WE-31</b>	<b>Simulation and Measurement Results of 150 GHz Integrated Silicon IMPATT Diodes</b>	<b>1269</b>
1:30 pm	M. Luschas, R. Judaschke, and J.-F. Luy	
<b>IF-WE-32</b>	<b>A Set of Integrated Circuits for 60 GHz Radio Front-End</b>	<b>1273</b>
1:30 pm	M. Kärkkäinen, M. Varonen, J. Riska, P. Kangaslahti, and V. Porra	
<b>IF-WE-33</b>	<b>Millimeter Wave Direct Quadrature Converter Integrated with Antenna for Broad-Band Wireless Communications</b>	<b>1277</b>
1:30 pm	J.-Y. Park, S.-S. Jeon, Y. Wang, and T. Itoh	
<b>IF-WE-34</b>	<b>A Novel HMSM Photodetector with Resonant Cavity for Short Haul Communications</b>	<b>1281</b>
1:30 pm	X. Chen, B. Nabet, F. Quaranta, A. Cola, and M. Currie	
<b>IF-WE-35</b>	<b>Effect of Substrate Modes in 40Gbit Travelling Wave LiNbO<sub>3</sub> Modulators</b>	<b>1285</b>
1:30 pm	K. Goverdhanam	
<b>IF-WE-36</b>	<b>Experimental Results for a CW-Mode Optically Controlled Microwave Switch with a Carrier-Confinement Structure</b>	<b>1289</b>
1:30 pm	S. Lee, Y. Kuga, and R.A. Mullen	
<b>IF-WE-37</b>	<b>Direct Carrier Modulation for Wireless Digital Communications Using an Improved Microwave-Photonic Vector Modulator (MPVM) Approach</b>	<b>1293</b>
1:30 pm	S. Chandramouli, W.D. Jemison, and E. Funk	
<b>IF-WE-38</b>	<b>A Novel Dual Frequency Rectenna for High Efficiency Wireless Power Transmission at 2.45 and 5.8 GHz</b>	<b>1297</b>
1:30 pm	Y.-H. Suh and K. Chang	
<b>IF-WE-39</b>	<b>Optimization of the Array Parameters in Waveguide-Based Spatial Power Combiners with Hard Horn Feeds</b>	<b>1301</b>
1:30 pm	M. Ozkar and A. Mortazawi	
<b>IF-WE-40</b>	<b>Radio-Wave Beam Shaping Using Holograms</b>	<b>1305</b>
1:30 pm	J. Meltaus, J. Salo, E. Noponen, M.M. Salomaa, V. Viikari, A. Lönnqvist, T. Koskinen, J. Säily, J. Häkli, J. Ala-Laurinaho, J. Mallat, and A.V. Räisänen	
<b>IF-WE-41</b>	<b>How to Increase Locking Range of Coupled Oscillator Cells without Lowering Q</b>	<b>1309</b>
1:30 pm	J. Shen and L.W. Pearson	

<b>IF-WE-42</b>	<b>Bandwidth Improvement in a Tile Based Spatial Power Amplifier</b>	<b>1313</b>
1:30 pm	A. Al-Zayed, S. Ortiz, and A. Mortazawi	
<b>IF-WE-43</b>	<b>A 10 GHz Integrated Class-E Oscillating Annular Ring Element for High-Efficiency Transmitting Arrays</b>	<b>1317</b>
1:30 pm	J.A. Hagerty and Z. Popović	
<b>IF-WE-44</b>	<b>A New Millimeter-Wave Printed Dipole Phased Array Antenna Using Microstrip-Fed Coplanar Stripline Tee Junctions</b>	<b>1321</b>
1:30 pm	Y.-H. Suh and K. Chang	
<b>IF-WE-45</b>	<b>A Novel Broadband T/R Module for Phased Array Applications in Wireless Communications</b>	<b>1325</b>
1:30 pm	C. Wang, C.T. Rodenbeck, M.R. Coutant, and K. Chang	
<b>IF-WE-46</b>	<b>Multi-Layer Spatial Angular Filter with Air Gap Tuner to Suppress the Grating Lobes of Microstrip Patch Arrays</b>	<b>1329</b>
1:30 pm	Y. Lee, S.H. Jeong, W.S. Park, J.S. Yun, and S.I. Jeon	
<b>IF-WE-47</b>	<b>Integrated MEM Antenna System for Wireless Communications</b>	<b>1333</b>
1:30 pm	B.A. Cetiner, L. Jofre, C.H. Chang, J.Y. Qian, M. Bachman, G.P. Li, and F. De Flaviis	
<b>IF-WE-48</b>	<b>The Design of T/R Module for X-Band APAA System Used in Satellite Communications</b>	<b>1337</b>
1:30 pm	Y.-B. Jung, S.-Y. Eom, S.-I. Jeon, J.-I. Choi, and H.-K. Park	
<b>IF-WE-49</b>	<b>Experimental APAA for Satellite Communications</b>	<b>1341</b>
1:30 pm	S.I. Jeon, J.I. Choi, Y.K. Choi, and S.H. Oh	
<b>IF-WE-50</b>	<b>A Novel K-Band Frequency-Controlled Beam-Steering Quasi-Yagi Array with Mixing Frequency Compensation</b>	<b>1345</b>
1:30 pm	T. Nishio, Y. Wang, Y. Qian, and T. Itoh	
<b>IF-WE-51</b>	<b>A Frequency Autonomous Retrodirective Array Transponder</b>	<b>1349</b>
1:30 pm	K.M.K.H. Leong, R.Y. Miyamoto, S.-S. Jeon, Y. Wang, and T. Itoh	
<b>IF-WE-52</b>	<b>Effects of Local Oscillator Phase Noise on Interference Rejection Capability of CDMA Receivers Using Adaptive Antenna Arrays</b>	<b>1353</b>
1:30 pm	G.W. Slade	
<b>IF-WE-53</b>	<b>A Balanced Adaptive Beamforming System for Broadband Wireless Communications</b>	<b>1357</b>
1:30 pm	S.-S. Jeon, Y. Wang, and T. Itoh	
<b>IF-WE-54</b>	<b>Impulse Ground Penetrating Radar for Nondestructive Evaluation of Pavements</b>	<b>1361</b>
1:30 pm	J.S. Lee, C. Nguyen, and T. Scullion	
<b>IF-WE-55</b>	<b>Reentrant Resonators for Microwave Measurement Units</b>	<b>1365</b>
1:30 pm	V.B. Romodin and L.V. Shebalkova	
<b>IF-WE-56</b>	<b>An Adaptive Multi-Functional Array for Wireless Sensor Systems</b>	<b>1369</b>
1:30 pm	R.Y. Miyamoto, K.M.K.H. Leong, S.-S. Jeon, Y. Wang, and T. Itoh	
<b>IF-WE-57</b>	<b>Compact Multibeam Imaging Antenna for Automotive Radars</b>	<b>1373</b>
1:30 pm	B. Schoenlinner and G.M. Rebeiz	
<b>IF-WE-58</b>	<b>A New Approach for RIN Peak and Phase Noise Suppression in Microchip Lasers</b>	<b>1377</b>
1:30 pm	M. Csörnyei, T. Berceci, T. Bánky, T. Marozsák, and P.R. Herczfeld	