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2006 IEEE Symposium on VLSI Technology



Hilton Hawaiian Village, Honolulu, Hawaii

The 26th Annual IEEE Symposium on VLSI Technology will be held June 13-15, 2006, at the Hilton Hawaiian Village in Honolulu, Hawaii. The VLSI Technology Symposium is jointly sponsored by the IEEE Electron Devices Society (EDS) and the Japan Society of Applied Physics (JSAP).

The VLSI Symposium is well recognized as one of the premiere conferences on semiconductor technology, and research results presented at the conference represent a broad spectrum of VLSI technology topics, including:

- New concepts and breakthroughs in VLSI devices and processes.
- New functional devices including quantum effect devices with possible VLSI implementation.
- Materials innovation for MOSFET and interconnect in VLSI.
- Advanced lithography and fine patterning technologies for high density VLSI.
- Process/Device modeling of VLSI devices.
- Packaging and reliability of VLSI devices.

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Your Comments Solicited

Your comments are most welcome. Please write directly to the Editor-in-Chief of the Newsletter at nstojadinovic@elfak.ni.ac.yu

Regional and Chapter News

USA, CANADA & LATIN AMERICA (Regions 1-6, 7 & 9)

IEEE World Conference on Photovoltaic Energy Conversion (WCPEC-4)

- by Jeffrey L. Gray

The 4th IEEE World Conference on Photovoltaic Energy Conversion (WCPEC-4) will be held May 7-12, 2006, at the Hilton Waikoloa Village in Waikoloa, Hawaii, which was also the location of the 1st World Conference on Photovoltaic Energy Conversion in December 1994. The world's leaders in photovoltaics will be attending and presenting the latest information on photovoltaic research and applications. More information regarding this exciting conference can be found at <http://www.wcpec.org>.

The conference, hosted by the IEEE PVSC and sponsored by the IEEE Electron Devices Society, is a joint conference of the 32nd IEEE PVSC, the European PVSEC, and the 16th Asia/Pacific PVSEC. The conference co-chairs are Sheila Bailey of the NASA Glenn Research Center in Cleveland, Ohio, Makoto Konagai of the Tokyo Institute of Technology, Japan, and Heinz Ossenbrink of the European Commission DG JRC in Ispra, Italy.

Papers will be presented not only in the traditional areas of photovoltaics-crystalline silicon, amorphous and nano/microcrystalline silicon, CIGS, CdTe and III-V materials - but also in fundamentals and new materials, modules and system development, concentrators, space applications and national programs and policies.

~ Sunit Tyagi, Editor

ED Puebla

- by Claudia Reyes Betanzo

The technical chapters of the IEEE Puebla Section organized a series of lectures to celebrate the 5th anniversary of the Section. The lectures were carried out at the University of the Americas (UDLA) in Puebla City on

November 14 and 15, 2005. There were a total of seven invited speakers, three were provided by other chapters, and two invited talks were provided by the Electron Devices Puebla Chapter. EDS Member, Dr. Rodolfo Quintero Romo from the Department of Electric Engineering and Solid State - CINVESTAV in Mexico, presented the talk entitled "Electronic Simulation: Electric transport in devices". EDS Distinguished Lecturer, Prof. Jacobus Swart from the CCS and FECC - UNICAMP in Brazil, gave his talk titled, "History of Microelectronics in Brazil and Recent Activities". The lectures were attended by several members and students of the IEEE in Puebla. This event was the second technical activity for the ED Puebla Chapter since it was formed in August 2004. All members of the ED Puebla Chapter are grateful to the invited speakers for their participation in this important event.

ED UNICAMP Student Branch

- by Ricardo Cotrin



Lectures on Micro/Nano Fabrication at the University of Campinas

On November 11th, the Student Chapter of EDS at UNICAMP held the last of a series of lectures about micro/nano technology. The "Lectures on Micro/Nano Fabrication" were held at the University of Campinas (Brazil) by invited speakers from our university and labs nearby and has the main goal to diffuse the research about this subject and to promote the knowledge among undergraduate students. From May to November 2005, the following lectures were delivered:

- May 23: Methodological aspects

of miniaturization; by Dr. Carlos I. Z. Mammanna (Head of Renato Archer Research Center)

- June 06: The evolution from micro to nano electronics; by Prof. Dr. José A. Diniz (School of Electrical Engineering/Unicamp)
- June 20: Microsystems; Can I have my own enterprise?; by Prof. Dr. Luís Otávio S. Ferreira (School of Mechanical Engineering/Unicamp)
- August 08: Introduction to optoelectronics; by Prof. Dr. Newton C. Frateschi (Physics Institute/Unicamp)
- August 29: Biomedical engineering; by Prof. Dr. José Wilson M. Bassani (School of Electrical Engineering/Unicamp)
- September 09: Carbon nanotubes; by Prof. Dr. Stanislav A. Moshkalyov (Center for Semiconductor Components/Unicamp)
- November 11: Nanotechnology: fundamentals, opportunities and challenges; by Prof. Dr. Osvaldo Alves (Chemistry Institute/Unicamp)

The lectures had an average attendance of 30 people among graduate and undergraduate students, professors and researchers and a certificate was given for those who attended 5 or more presentations.

~ Jacobus W. Swart, Editor

EUROPE, MIDDLE EAST & AFRICA (REGION 8)

ED Germany

- by Holger Vogt

Starting January 2006, Holger Vogt will chair the ED German Chapter. He has many years of experience with silicon based semiconductor processing and device development.

In 2005 an extended chapter meeting was organized to assemble members from the many research fields and to discuss new visions and missions of IEEE EDS in Germany. Combining or even merging electrical/electronic, mechanical and optoelectronic/photonic functions in the

micro and nano scale, top down and bottom up, offers potential for application in future high performance systems, and shall be considered in ED chapter activities. A newsletter distributed to all German EDS members summarized the main topics.

In 2006, a workshop on 'Advanced Electron Devices' shall provide a forum to continue the discussions. It will take place at Duisburg, June 13-14, at Fraunhofer IMS. The workshop will offer an informal atmosphere to exchange recent research results and bridge the gap between novel nano concepts and the silicon world. We especially encourage students to report on their actual work in progress. Further information is available from holger.vogt@ims.fraunhofer.de.

SAFE Workshop

- by Helga Varwijk

On November 17-18, 2005, the Dutch Technology Foundation organized two parallel workshops in Veldhoven, The Netherlands, co-sponsored by IEEE EDS. The SAFE (semiconductor advances for future electronics and sensors) Workshop, focused on RF devices and modeling, devices characterization and technology and materials related topics. This year's workshop dedicated special attention to the particle detection and medical applications. In total, there were 10 oral and 43 poster presentations. In parallel, the more systems oriented workshop on circuits, systems and signal processing took place. For this workshop, 10 oral and 111 posters were presented. A combined evening session entitled, "Giga sensors for atto objects" dealt with the new challenges for the next generation particle detectors at CERN (Geneva). The combined number of attendees was 225.

~Cora Salm, Editor

ED Israel

- Gady Golan

On Thursday, November 24, 2005, at the Holon Institute of Technology (HAIT), Holon, Israel.

Lecturer: Dr. Alex Axelevich, Staff member at HAIT, Israel.

Subject of meeting: "Hot-Probe Method for Evaluation of Impurities Concentration in Semiconductors"

Abstract:

Electrical, optical, and mechanical properties of thin films significantly differ from those of bulk materials. Also, these properties are very influenced on the technological parameters of the films deposition. Therefore, characterization methods for evaluation of thin film properties become highly important. A novel approach to the well known "Hot-Probe" method is proposed and applied in our work. The conventional Hot Probe characterization method enables only the definition of a semiconductor type, P or N, by identifying the majority charged carriers. According to the new Hot Probe technique, one can measure and calculate the impurities concentration and charged carriers dynamic parameters. Feasibility proof the upgraded Hot Probe method was done in Si and Ge bulk, and in thin film semiconductor samples.

Chairman of the meeting: Professor Gady Golan. Seventy people, students and academic staff, attended the meeting at HAIT.

On Thursday, January 5, 2006, at the Holon Institute of Technology (HAIT), Holon, Israel.

Lecturer: Dr. Boris Axelrod, Staff member at HAIT, Israel.

Subject of meeting: "A Cascade Boost-Converter - Inverter with Optimized Output Waveform"

Abstract:

Two structures, a switched-capacitor-boost converter and a two-level inverter, are connected in cascade. As a result, a staircase waveform of the output voltage is provided. Such a multilevel waveform is close to a sinusoid; its harmonics content can be reduced by multiplying the stage number as well as by optimization of stage duration. A Fourier analysis of the output waveform is performed. The design is optimized for minimizing factor THD. Simulations and experiments on two prototypes confirm the theoretical analysis.

Chairman of the meeting: Professor Gady Golan. Sixty people, students and academic staff, attended the meeting at HAIT.

~ Zhirun Hu, Editor

ED Poland

- by Andrzej Napieralski

The ED Poland Chapter is a co-organizer of the International Conference MIXDES 2006, which will be held on June 22-24, 2006, in Gdynia, Poland. During the conference two special sessions are planned:

- "Compact Models - The Heart of Mixed-Signal Design Flow" organized by Prof. Hiroshi Iwai (Tokyo Institute of Technology, JAPAN) and Dr. Wladyslaw Grabinski (Freescale, Switzerland)
- "Coordinated Accelerator Research in Europe Project" organized by Mariusz Grecki (Technical University of Lodz, Poland) and Stefan Simrock (DESY, Germany)

For the opening plenary session the following presentations are planned:

- "Physical Models for Smart-Power Devices" - Massimo Rudan (University of Bologna, ITALY)
- "Silicon Carbide Devices and Processes - Present Status and Future Perspective" - Mikael Östling (Royal Institute of Technology, SWEDEN)
- "The New Generation of the Photoelectric Measurement Methods of MOS Structure Parameters" - Henryk M. Przewlocki (Institute of Electron Technology, POLAND)
- "TUNNETT Diode Oscillators for mm-Wave Wideband Communication and for Terahertz Electronics" - Piotr Plotka (Semiconductor Research Institute, JAPAN)

During the conference a meeting of the Poland Section of the IEEE ED Poland Chapter and Microelectronics Section of Electronics and Telecommunication Committee of the Polish Academy of Sciences will take place. More information about the conference can be found at the web site <http://www.mixdes.org>.

~ Andrzej Napieralski, Editor

ED/MTT/CPMT/COM/SSC Novosibirsk

- by Viatcheslav P. Shuvalov

The fifth IEEE Russia Conference on Microwave Electronics: Measurement, Identification, Application (MEMIA'2005) was successfully held



Invited lecturers of the 2006 MEMIA plenary meeting (NSTU, Novosibirsk, December 12, 2005)

at Novosibirsk State Technical University December 12-15, 2005. This conference is one of the main events of 2005 for our chapter. Due to great international support from the IEEE MTT Society, as well as the Harbin Institute of Technology (Harbin, China), this conference has received real international status.

Modern problems of microwave electronics, theory of circuits, telecommunications technology and their applications were discussed in this conference. A separate session was devoted to the problems of designing the electron devices and physical effects in these devices.

The volume of proceedings was prepared and issued. In comparison with the 4th MEMIA conference (in 2003), this volume was higher due to an increase in the number of papers and participants, especially from China. We hope, due to this conference, that the co-operation with the Harbin Institute of Technology will be developed and increased next time.

The MEMIA'2005 Organizing Committee is thankful to IEEE MTT representative, Prof. Jozef Modelski, who has provided the special technical support to our conference. We are thankful to the Harbin Institute of Technology representative, Prof. Qiu Jing Hui, for technical and financial co-sponsorship. We are especially thankful to Prof. Irina B. Vendik (St. Petersburg, Russia), for her participation and beautiful invited report.

The Organizing Committee for MEMIA'2005 is also thankful to all who have invested their time and efforts into the success of the conference. Especially to the invited foreign participants, who have visited our conference 'in the heart of Siberia', in

spite of 'pure Siberian' weather (very cold and windy with temperatures 27 degrees below zero). We hope, having visitors even with these extreme conditions, will help to attract the interests of many other potential foreign participants.

AP/ED/MTT/COM/EMC Tomsk

- by *Oleg V. Stukach*



Participants of the 2005 SIBCON conference (TUCSR, Tomsk, October 21, 2005)

The sixth IEEE Siberian Conference on Control and Communications (SIBCON) was held October 21-22, 2005, in Tomsk, Russia. The conference was organized by the Tomsk Joint Chapter, the GOLD Affinity Group of the IEEE Siberia Section; Tomsk Polytechnic University; sponsored by IEEE and the Russian Foundation for Basic Research. Topics included Mathematical Simulation and Modeling in Modern Technologies of Control and Information Processing; the Basic Problems of Communication and Control Theory, Cryptology; and Digital Video and Image Processing. There was also a special session on Materials for Electron Devices and X-Ray Detectors.

The technical program consisted of paper presentations and discussions, and the social program included an excursion, banquet and bowling. We cordially invite you and your colleagues to join the Scientific Program Committee of the next SIBCON in 2007. Please find the Call for Papers at our Web site <http://www.comsoc.org/tomsk>.

~ *Alexander V. Gridchin, Editor*

ASIA & PACIFIC (REGION 10)

ED Kansai

- by *Toshimasa Matsuoka*

The 5th Kansai Colloquium Electron

Devices Workshop was successfully held at the Osaka University Nakanoshima Center, Osaka, Japan, on October 26, 2005. The Workshop was sponsored by the ED Kansai Chapter and the Graduate School of Engineering, Osaka University, which offered a good opportunity for students and researchers in the Kansai area to touch the up-to-date world-class researches and developments. Eleven papers about silicon and compound semiconductor device technologies were selected for the presentation. The Award Committee selected three papers for the 5th MFSK (Message From Spirited Kansai) Award. The winners were Prof. Tsunenobu Kimoto for his paper entitled "Design and Fabrication of RESURF MOSFETs on 4H-SiC(0001), (1120), and 6H-SiC(0001)," Dr. Kenji Komiya for "Detailed Investigation of Geometrical Factor for Pseudo-MOS Transistor Technique," and Dr. Yasuhiro Fujii for "Soft Error Free, Low Power and Low Cost Super SRAM with 0.98 um² Cell by Utilizing Existing 0.15um-DRAM Process." They were honored with a memorial wall plaque engraved with their name.

ED Japan

- by *Hiroshi Ishiwara*



Prof. Kenji Taniguchi (Osaka Univ., Chair of EDS Kansai) and Dr. Kenji Komiya at the 5th Kansai Colloquium Electron Devices Workshop, October 26, 2005, Osaka, Japan

The ED Japan Chapter organized the 9th IEEE EDS Mini-colloquium on Nanometer CMOS Technology (WIM-NACT-9), held on October 25, 2005, at the Tokyo Institute of Technology, Yokohama, Japan, as a co-sponsor. It was reported in the January 2006 issue of the EDS Newsletter in detail.