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— Chicago Section —

Cell Phone Radiation

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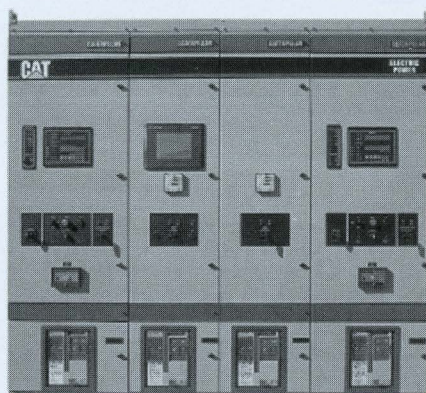
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SCANFAX

April 2005
Volume 57, Issue 4

FEATURES

- 4 Recurrent Scares Over Cell Phone Handset Radiation Danger Lack Solid Evidence

UPCOMING EVENTS

- 6 ED/CAS/SSC Chicago Chapter and the IIT Student Chapter CMOS Scaling Limits and Nanoelectronic Devices Friday, April 1, 2005
- 7 IEEE Communications Society and IEEE Fox Valley and UniForm Chicago 3rd Annual IIT/IEEE Security Workshop Thursday, April 7, 2005
- 8 Chicago Chapter of the IEEE Power Engineering Society CTA Power Distribution Wednesday, April 13, 2005
- 9 IEEE EMC Society of Chicago Chapter Broadband Over Power Lines (BPL) Tuesday, April 19, 2005
- 9 IEEE - IAS/IES Dinner Presentation Overview of LEED and Green Building Design Wednesday, April 20, 2005
- 10 ED/CAS/SSC Chicago Chapter, IIT Student Chapter and the Electron Devices Distinguished Lecture Series Application of Computational Fluid Dynamics (CFD) Based Technology to Computational Electromagnetics Wednesday, April 27, 2005

DEPARTMENTS

- 6 Employment Opportunity
11 Advertiser Index
11 Professional and Business Directory

Chicago Section Executive Committee Meeting

Tuesday, April 12, 2005, 7:00 p.m.

DeVry DuPage, Room TBA, 1221 N. Swift Rd., Addison, IL

No Registration Needed

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Recurrent Scares Over Cell Phone Handset Radiation Danger Lack Solid Evidence

By Paul Zukowski

It's a question that keeps popping up in the popular media: Are there potential health risks due to the RF emissions from hand-held cellular telephones and PCS devices? The alarms seem to come more from Europe than the U.S., perhaps because cell phone use has been more widespread there.

The controversy has two important aspects: (1) Setting standards for how the RF emissions are measured. (2) Coming up with scientific studies of the effects for this RF radiation on humans.

Here in the U.S., the Federal Communications Commission is in charge of setting exposure guidelines, which are based on work by IEEE and the National Council on Radiation Protection and Measurements, and promulgated through the American National Standards Institute (ANSI).

The FCC requires that wireless phones sold in the United States demonstrate compliance with human exposure limits adopted in 1996. The relative amount of RF energy absorbed in the head of a wireless telephone-user is given by the specific absorption rate (SAR). For users of a cellular or PCS phone, the SAR limit is an absorption threshold of 1.6 watts/kg (W/kg), as measured over any one gram of tissue.

Information on SAR for a specific phone model can be obtained for many recently manufactured phones using the FCC ID number for that model. The FCC ID number is usually printed somewhere on the case of the phone. Sometimes it may be necessary to remove the battery pack to find the number. There is a place to enter it on the FCC Web site, and the SAR will

be part of the phone's "Grant of Equipment Authorization." Most manufacturers have posted the SAR numbers for their phones on their corporate Web sites.

Before FCC approval can be granted for marketing of a cellular or PCS phone, compliance with the 1.6 W/kg limit must be demonstrated. Also, testing of hand-held phones is normally done under conditions of maximum power usage. In reality, normal power usage is less and is dependent on distance of the user from the base station transmitter.

SAR levels of current phones range from 0.16 for a Sony Ericsson Z600 to 0.73 for a Nokia 6610i.

Measuring SAR

The standard for performing accurate SAR measurements was based on IEEE 1528, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques." It was the first standard to address the complex issues and instrumentation requirements involved.

IEEE 1528 did not set specific limits for exposures of users of cellular phones and other personal communication devices, but helped wireless device manufacturers and regulators assess compliance with the requirements of the FCC and similar government agencies in other countries that limit exposure from personal communication devices.

Recently the International Electrotechnical Commission (IEC) published a new international standard specifying test methods for compliance with limits on radio wave exposure from mobile phones. IEC 62209-1 was developed jointly by the IEC, the European Committee for Electrotechnical Standardization (CENELEC) and IEEE, who worked together informally through common membership in various technical committees.

Human Impact

The years of negative publicity, speculation and concern over claims of possible health effects due to RF fields from hand-held wireless telephones prompted industry-sponsored groups, such as Wireless Technology Research LLC and Motorola Inc., to initiate research programs aimed at investigating whether there is any risk to users of these devices.

Past studies carried out at frequencies both higher and lower than those used for cellular and PCS phones have led expert organizations to conclude that typical RF exposures from these devices are safe.

According to the FCC, there is no scientific evidence that proves that wireless

phone usage can lead to cancer or a variety of other problems, including headaches, dizziness or memory loss. However, the federal government is monitoring the results of the ongoing industry-sponsored research through an inter-agency working group led by the EPA and the FDA's Center for Devices and Radiological Health, and the FDA is participating in an industry-funded research project to further investigate possible biological effects.

In England, new debate was recently sparked by Sir William Stewart, Chairman of the National Radiological Protection Board, who said that making cell phones available to children ages 3 to 8 was "unjustified." He added that children between the ages of 9 and 14 should place only brief calls on mobile handsets to limit exposure to radiation, out of concern that young people's brains are still developing.

This was in spite of the fact that the Advisory Group on Non-Ionising Radiation, working under the National Radiological Protection Board, had said that the weight of evidence available does not suggest that there are adverse health effects from exposure to RF fields below guideline levels. Stewart is concerned that mobile phones have been in use for only a relatively short time so the possibility remains open that there could be health effects from exposure to RF fields below guideline SAR levels.

In the wake of the comments, some U.S. consumer groups are calling for more independent studies of possible cell phone risk. Representatives of the U.S. wireless industry pointed to a number of recent studies that offered no conclusive evidence of health issues linked to wireless phone usage. A spokesman for CTIA-The Wireless Association, a trade association representing a variety of wireless companies, Washington, D.C., said that concern should be guided by science and not by speculation.

Consumer Reports pointed out that some of the recent studies looking at possible hazards from cell phone use should be discounted because they focus on analog phones, which are being rapidly replaced by digital phones. Analog phones not only use considerably more power than digital phones, their emission patterns are also different.

One of those recent studies was done in Sweden by scientists at the Karolinska Institute and released in October. It found a small degree of risk of a nonmalignant tumor in the acoustic nerve in longtime cell phone users. Acoustic neuroma tumors can affect hearing and balance, and occur in less than one adult per 100,000 people annually. The results showed that people who had been using mobile phones for more than 10 years have a fourfold increase in the risk of developing such a tumor.

The Swedish study included 150 acoustic neuroma patients. It is part of a large collaboration called Interphone, which is coordinated by the International Agency for Research on Cancer in Lyon, France. Researchers from 13 countries using similar methodology are investigating three types of tumors whose location makes them the most likely candidates for a link with mobile phone radiation. The only other country to report is Denmark, which showed no such findings as the Swedish study found.

In addition to epidemiological studies, the other approach exposes laboratory animals or cell cultures to radiation simulating mobile phone emissions. These lab studies sometimes produce results such as DNA damage to cells, but have come up with no sustained evidence of harm.

As technology improves, manufacturers are progressively reducing the power output of their phones, so radiation risks to individual users are diminishing. Still, the jury is out as to whether long-term exposure will produce increased risks. If you are worried, experts advise using a headset. ■



Afternoon Meeting

ED/CAS/SSC Chicago Chapter and the IIT Student Chapter
CMOS Scaling Limits and Nanoelectronic Devices

Friday, April 1, 2005

Professor Yoshio Nishi
Stanford University

About the Topic:

It has been quite a while since silicon based CMOS scalability was questioned in terms of both physical limit and engineering limit. Despite several good reasons for a pessimistic forecast of CMOS scaling, it is the fact that the progress is still in line with ITRS roadmap at this moment. This talk will discuss the progress made for CMOS scaling in drive current improvement and suppression of off current of MOSFET, with introductions of new structures, new materials for channel, gate insulator and gate electrode. Further discussed will be a variety of revolutionary nanoelectronics devices, such as nanowires/nanotubes, new materials based non-volatile memory, and other emerging research interest on the horizon.

About the Speaker:

Professor Yoshio Nishi received a BS in Materials Science and Engineering from Waseda University, and a PhD in

Electronics Engineering from University of Tokyo. He joined Toshiba Corporation in 1962, working in the area of semiconductor materials and processes. He also worked in the areas of MNOS nonvolatile memory, silicon on sapphire (SOS) based device research, and memory technology R&D. Later he managed a group in the Semiconductor Device Engineering Laboratory, and developed the world's first 1Mbit CMOS DRAM, and 256Kbit SRAM and EPROM. In 1986 he joined Hewlett-Packard as Director of the Silicon Process Lab, and later the Center Director for ICBD R&D. In 1996 he joined Texas Instruments Inc., as Senior Vice President and Director of R&D. In 2002 he joined Stanford University as Professor of Electrical Engineering, and also as Director of the Stanford Nanofabrication Facility, and lately as Research Director of the Center for Integrated Systems. His research interest at Stanford is quantum confined high mobility channel, metal gate work function engineering, and non-volatile nanowire based memory devices.

Professor Nishi has published over 120 papers, several books co-authored and held more than 50 patents including Schottky source drain MOSFET. He is a Fellow of IEEE and the recipient of IEEE Jack Morton Award (1995) and IEEE Robert Noyce Medal (2002).

Meeting Location:

Illinois Institute of Technology
Room 118, Siegel Hall
3301 S. Dearborn St., Chicago, IL
For parking information and maps visit:
<http://ewh.ieee.org/r4/chicago/ed-cas-ssc>

Time:

Presentation 3:15 p.m.

Reservations:

No reservations needed

Information:

Email Professor Wang at:
awang@ece.iit.edu or the Chapter at:
ed.cas.ssc.chicago@ieee.org or visit
<http://ewh.ieee.org/r4/chicago/ed-cas-ssc>

All-Day Workshop

IEEE Communications Society and IEEE Fox Valley and UniForm Chicago
3rd Annual IIT/IEEE Security Workshop

Thursday, April 7, 2005

About the Topic:

Illinois Institute of Technology's (IIT) Center for Professional Development, the IEEE Communications Society, IEEE Fox Valley and UniForum Chicago will sponsor the 3rd Annual Security Workshop on Thursday 7 April 2005 at IIT's Rice Campus in Wheaton Illinois. The last workshop, held on 26 February 2004 was attended by over 200 people. The workshop consisted of technical sessions, vendor presentations, and a product show. Organizations that participated in the workshop included, Cisco Systems, the Federal Bureau of Investigation, Red Hat, Microsoft, Network Associates, CompTIA, Lucent Technologies, Wheaton College, and many others.

The format for the 2005 workshop will consist of:

- Technical sessions (Presentations of technical issues and solutions.)
- Vendor sessions (Vendors present and discuss their products and services.)
- Exhibitor (Vendors exhibit their products and services.)
- Tutorials (Vendor neutral tutorials on topics of interest.)

There are several ways you and/or your organization can participate in this event:

- Sponsor – become an event sponsor
- Session Organizer - identify/invite the speakers, organize and moderate sessions
- Tutorial Presenter – present a tutorial on a security topic
- Presenter – make a presentation on a topic of interest

- Exhibitor – promote your business with a table-top display (\$75)
- Attendee – attend the event (\$45 per person)

Security areas of interest include (we welcome your suggestions for additional topics):

- Sectors (problems and solutions specific to these economic sectors)
 - Healthcare & medicine
 - Banking & financial
 - Education
 - Legal & law enforcement
 - Local government
 - Energy
 - Communications
 - Transportation
 - Manufacturing
- Technology (problems and solutions related to these specific technology areas)
 - Wireless network security (LAN & WAN)
 - Security at universities & other "open" organizations
 - Small business & home office security
 - Security at universities & other "open" organizations
 - Security Capability Maturity Models
 - Open source security products & systems
 - Organizational security policy
 - Security vulnerability auditing
 - SPAM, phishing & what to do about them

- VoIP security and privacy
- Operating system security
- Wired network security
- Embedded systems
- Security and authentication devices

Student projects are also invited.

Information:

For additional information, please contact Professor Bill Lidinsky at lidinsky@iit.edu or 630.682.6028.

If you are interested in attending, please visit <http://www.cpd.iit.edu/netsecure05/> or contact Janet Reif at reif@iit.edu or 630-682-6035.

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A. Epstein and Sons International, Inc. is an established and respected 80+ year old Architecture, Engineering, Construction and Interior Design firm. We are one of the largest multi-faceted engineering design firms in the U.S. Epstein is currently looking for engineering professionals to join our rapidly growing MEP Department. Our beautiful corporate office is located in Chicago's West Loop, convenient to transportation. We offer all employees excellent wages and a competitive benefits package.

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Lunch Meeting

Chicago Chapter of the IEEE Power Engineering Society

CTA Power Distribution

Wednesday, April 13, 2005

Frank Machara
LDP Consulting Engineers

About the Topic:

The presentation will include the following topics:

- Overview of CTA Power Distribution System
- Substation description
- AC service, transformer, rectifiers and dc switchgear
- Substation load characteristics
- Total load characteristics and rail car characteristics
- DC distribution system
- Positive supply and negative return (cable, rail and structure)
- Design criteria
- Normal and contingency designs

- Challenges in DC distribution design
- Remote faults and stray currents

About the Speaker:

August 2003 - Present

Frank retired from the Chicago Transit Authority in August of 2003 and is currently a Senior Electrical Engineer at Laramore, Douglass & Popham Consulting Engineers in Chicago. He is the Project Coordinator for several Chicago Transit Authority substation designs including the Brown/Ravenswood Line Rehabilitation, Red/Dan Ryan Line Rehabilitation and the Washington Street Substation on the Blue Line Connector.

Prior to August 2003

Frank spent 26 years at the Chicago Transit Authority starting as an Electrical Engineer

in CTA's Power & Way Maintenance Division's Technical Support Group. While at CTA, Frank was involved primarily in substation and traction power projects including the Blue Line Extension to O'Hare Airport, the Orange Line expansion to Midway Airport and the Howard-Dan Ryan Subway Connector. The last three years of his career at CTA, Frank was the General Manager, Power & Way Maintenance, and was responsible for the system-wide maintenance and in-house construction of 242 miles of transit infrastructure. Disciplines included electrical, civil and structural. Areas of involvement included Substations, PowerDistribution, Signal, Track and Structures.

Location:

Chicago Bar Association, 321 South Plymouth Court, Chicago, IL (near the intersection of Jackson and Dearborn)

Time:

11:30 Social
12:00 Lunch (optional)
12:00 Presentation
1:00 Adjourn

Reservations:

Lunch tickets can be purchased in the lobby bookstore (\$12.00). Please call the IEEE Business Office by noon on Monday, April 11, 2005 at (630) 493-4333 or (800) 898-IEEE to make your reservation.

Continuing Education:

IEEE technical meetings may be acceptable as continuing education where required for maintenance of professional engineering licensure. Refer to the individual state's requirements for details.

Information:

For more information, please visit the Chicago Chapter IEEE PES web site: <http://peschicago.org>

Evening Meeting

IEEE EMC Society of Chicago Chapter

Broadband Over Power Lines (BPL)

Tuesday, April 19, 2005

Ed Hare
American Radio Relay League (ARRL)

About the Topic:

Broadband power line (BPL) is the term coined by the FCC for new modems (BPL modems) used to deliver IP-based broadband services on electric power lines. BPL technology will enable electric power lines to function as a third wire into the home, and create competition with the copper telephone line and cable television coaxial cable line. This presentation will cover the basics of BPL technology and discuss some of the issues regarding its implementation.

About the Speaker:

Ed Hare, W1RFI, was first licensed in 1963. With 16 years in the electronics industry, he came to ARRL in 1986. Over the years he has written quite a number of RFI articles, ranging from articles for QST and the "ARRL Handbook" to articles that have appeared in professional trade journals. He is also one of the editors and authors of the ARRL "RFI Book" and the author of the ARRL's book on RF exposure, "RF Exposure and You."

Ed Hare is now the Laboratory Manager of the American Radio Relay League (ARRL), an organization made up of around 160,000 amateur radio operators in the U.S. He's also the Chairman of that group's Ad Hoc BPL Working Group.

Meeting Location

Elite Electronic Engineering, Inc
1516 Centre Circle
Downers Grove, IL 60515

Time:

6:30 p.m. Social Hour
7:00 p.m. Meeting Start

Reservations:

Steve Laya (Elite Electronic Engineering)
Phone: 630-495-9770 x119

Information:

IEEE EMC Society www.ewh.ieee.org/soc/emcs/chicago/

Evening Meeting

IEEE - IAS/IES Dinner Presentation

Overview of LEED and Green Building Design

Wednesday, April 20, 2005

To be announced

About the Topic:

The US Green Building council has established the Leadership in Energy & Environmental Design (LEED) System. This is a leading-edge system for designing, constructing, operating and certifying the world's greenest buildings. Many organizations, cities, and towns are implementing requirements for LEED buildings, including the City of Chicago. The presentation will provide an overview of the LEED system. This presentation will be of value to all design professionals including architects and engineers.

Meeting Location:

COSTA'S (GREEKTOWN) 340 Halsted St. Chicago, IL. Costa's is located in Greektown on the corner of Van Buren and Halsted. See www.iaschicago.com for detailed directions and a map.

Time:

5:30 Social
6:00 Dinner
7:00 Presentation

Reservations:

Please call the IEEE Business Office by noon on Monday 10 January 2005 at (630) 493-4333 or (800) 898-IEEE to make your reservation. You can also make your reservations on line at www.iaschicago.com

Cost:

Your cost includes the presentation and a four-course dinner with a choice of the main entry - Roast lamb, Chicken, or Fish. (Vegetarian or special dietary meals available upon request). Cost is \$25 IEEE Member and \$30 non-member. Valet parking is included with your meal.

Information:

Visit IEEE Chicago Section IAS/IES website at www.iaschicago.com.

Continuing Education:

For P.E. licenses that require continuing education for renewal, attendance at IEEE Technical Meetings is acceptable as one Professional Development Hour (PDH) per meeting.

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Evening Meeting

ED/CAS/SSC Chicago Chapter, IIT Student Chapter and the
Electron Devices Distinguished Lecture Series

Application of Computational Fluid Dynamics (CFD) Based Technology to Computational Electromagnetics

Wednesday, April 27, 2005

Professor Ramesh K. Agarwal
Washington University

About the Topic:

In recent years, there has been considerable thrust toward the development of finite-difference time-domain (FDTD) and finite-volume time-domain (FVTD) methods for the numerical solution of Maxwell equations for electromagnetic scattering from complex three-dimensional objects. Maxwell equations are written in conservation form and solved on a three-dimensional grid both inside and outside the scattering body. Higher-order spatial and temporal discretization are generally employed to obtain accurate solutions efficiently especially for large scattering bodies. An important aspect of the calculations is the formulation and implementation of the boundary conditions – both the radiation boundary condition (RBC) and the material interface boundary conditions in discretized form. Recent developments in boundary conditions formulations and implementations will be reviewed and critically examined. Three-dimensional examples including complete aircraft configurations will be presented to demonstrate the power of the FVTD approach.

About the Speaker:

Professor Ramesh K. Agarwal is the William Palm Professor of Engineering and the director of Aerospace Research

and Education Center at Washington University in St. Louis. From 1994 to 2001, he was the Sam Bloomfield Distinguished Professor and Executive Director of the National Institute for Aviation Research at Wichita State University in Kansas. From 1978 to 1994, he was the Program Director and McDonnell Douglas Science and Engineering Fellow at McDonnell Douglas Research Laboratory (MDRL) in St. Louis. Dr. Agarwal obtained his Ph.D. from Stanford University in 1975. Since then, he has worked in Computational Fluid Dynamics (CFD), Computational Magneto-hydrodynamics and Electromagnetics, and Semiconductor Device Simulation. Dr. Agarwal is a Fellow of eight societies - American Association for Advancement of Science (AAAS), American Institute of Aeronautics and Astronautics (AIAA), American Physical Society (APS), American Society of Mechanical Engineers (ASME), Royal Aeronautical Society (RAeS), Society of Manufacturing Engineers (SME), Society of Automotive Engineers (SAE), and the Institute of Electrical and Electronics Engineers (IEEE). He has served as a distinguished lecturer of AIAA (1996-1999), ASME (1994-1997), and IEEE (1994-2005). He has received many honors and awards for his research contributions including the ASME 2001 Fluids Engineering Award and AIAA 2002 Sustained Achievement Award.

Meeting Location:

Please join us for our first meeting at the world renowned, architectural marvel, the McCormick Tribune Campus Center at IIT (see "The Tube").

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State and 33rd St., Chicago, IL
For parking information and maps visit:
<http://ewh.ieee.org/r4/chicago/ed-cas-ssc>

Time:

Free food and drink 6:30 p.m.
Presentation 7:00 p.m.

Reservations:

Please call the IEEE Message Center at (800)898-IEEE or (630) 493-4333 by 1:00 PM Monday, April 25th.

Information:

Email the Chapter at: ed.cas.ssc.chicago@ieee.org or visit <http://ewh.ieee.org/r4/chicago/ed-cas-ssc>

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