2006 Asia-Pacific Microwave Conference
APMC 2006
December 12-15, 2006 Pacifico Yokohama, Yokohama, Japan
http://www.apmc2006.org

"SAIL FOR THE MICROWAVE OCEAN"

Sponsored by
the Institute of Electronics, Information and Communication Engineers (IEICE) of Japan
Cooperatively sponsored by
IEEE MTT-S, URSI, EuMA and IEEE MTT-S Japan Chapter

CONFERENCE TOPICS

Active Devices and Circuits
- Low-Noise Devices and Circuits
- High-Power Devices and Circuits
- Control Circuits (MDX, Vco, SM, etc.)
- MMICs and MMICs (Receivers, Transmitters, etc.)
- Silicon RF Devices and Circuits (CMOS, SiGe, etc.)
- High-Speed Digital Circuits
- Others

Passive Components
- Filters and Resonators
- Ferrite and Surface Wave Components
- Packaging Techniques
- Passive Devices and Circuits
- Waveguides and Stripes
- Microwave Superconductivity
- Others (RDM Components, RF MEMS, LTCC Devices, etc.)

Systems
- Optical Fiber Systems
- Microwave Applications (ITS SPS, etc.)
- Microwave Medical & Biological Applications/EMC
- Millimeter-Wave Radar and Sensor (Remote Sensing, etc.)
- Microwave Photonics
- Measurement Techniques
- Others (System on Package, etc.)

Antenna and Propagation
- Scattering and Propagation
- Electromagnetic Field Theory and CAD
- Antenna Theory
- Microwave Antennas
- Antenna Systems (Phased Array, Active and Adaptive Antennas, MIMO Systems, etc.)
- Others (Artificial Materials, Photonic Band Gap, etc.)

WORKSHOPS AND SHORT COURSES

The APMC 2006 will provide exciting workshops and short courses conducted by a group of specialists in a wide range of interesting and timely subjects.

MICROWAVE EXHIBITION

Microwave Exhibition, which is the largest trade show dedicated to RF and microwave in Asia, will be held as a part of APMC 2006 from Wednesday Dec. 13 to Friday Dec. 15. More than 350 microwave related companies will exhibit the latest products, and various technical seminars will also be available. Over 6000 academic and business visitors from around the world will be expected.

TIMETABLE

For further information, please visit APMC 2006 web site at http://www.apmc2006.org

REGISTRATION FEES

<table>
<thead>
<tr>
<th>Category</th>
<th>Early registration (online): 3 Jul. - 30 Sep., 2006</th>
<th>Online registration: 1 Oct. - 30 Nov., 2006</th>
<th>Onsite registration: On the conference day</th>
<th>Student/Retiree</th>
<th>Workshop/Short course</th>
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<tr>
<td>Regular</td>
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INFORMATION: Prof. Masayoshi Aikawa Chair, Steering Committee c/o Real Communications Corp., 3F Shinmatsudo S Bldg., 1-809 Shinmatsudo, Matsudo 270-0034, Japan Phone: +81-47-309-3616, Fax: +81-47-309-3617, E-mail: mweapmc@i.ocn.ne.jp http://www.apmc2006.org
<table>
<thead>
<tr>
<th>Day</th>
<th>Location</th>
<th>Time</th>
<th>Session</th>
</tr>
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<tbody>
<tr>
<td>12/12(MON)</td>
<td>Room A</td>
<td>9:00</td>
<td>Workshop 1: System-on-Chip/One-Chip Radio</td>
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<td>Room B</td>
<td>9:30</td>
<td>Workshop 2: Advanced MIM Microstrip Linearity</td>
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<td>Room C</td>
<td>10:00</td>
<td>Workshop 3: Standardization of Measurement Methods</td>
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<td>Room D</td>
<td>11:00</td>
<td>Workshop 4: Emerging Technology and Application of RFTI</td>
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<td>Room E</td>
<td>12:00</td>
<td>Workshop 5: Millimeter and Terahertz Wave Applications</td>
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<td>Room F</td>
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<td>Workshop 6: Technical Aspects of RF and Information Security</td>
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<td>Room G</td>
<td>2:00</td>
<td>Short Course 1: Metamaterial Engineering for Microwave</td>
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<td>Room H</td>
<td>3:00</td>
<td>Short Course 2: Digital RF Processor (DRP™) All-Digital TX and Discrete-Time RX</td>
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<td>Room A</td>
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</table>

Welcome Reception (6:30 p.m.~7:30 p.m.) "Yokohama Red Brick Warehouses"
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRAM AT A GLANCE</td>
<td>i</td>
</tr>
<tr>
<td>FLOOR PLAN</td>
<td>ii</td>
</tr>
<tr>
<td>GREETINGS FROM THE STEERING COMMITTEE CHAIR</td>
<td>1</td>
</tr>
<tr>
<td>MESSAGE FROM THE TECHNICAL PROGRAM COMMITTEE CHAIR</td>
<td>1</td>
</tr>
<tr>
<td>GENERAL INFORMATION</td>
<td>2</td>
</tr>
<tr>
<td>CONFERENCES SITE</td>
<td>2</td>
</tr>
<tr>
<td>YOKOHAMA</td>
<td>2</td>
</tr>
<tr>
<td>REGISTRATION</td>
<td>2</td>
</tr>
<tr>
<td>HOTEL ACCOMMODATIONS</td>
<td>3</td>
</tr>
<tr>
<td>OFFICIAL TRAVEL AGENT</td>
<td>4</td>
</tr>
<tr>
<td>YOUTH HOSTEL INFORMATION</td>
<td>4</td>
</tr>
<tr>
<td>TRANSPORTATION</td>
<td>4</td>
</tr>
<tr>
<td>VISA REQUIREMENT FOR FOREIGN ATTENDEES</td>
<td>4</td>
</tr>
<tr>
<td>OTHER INFORMATION</td>
<td>5</td>
</tr>
<tr>
<td>SOCIAL PROGRAM</td>
<td>5</td>
</tr>
<tr>
<td>MEETINGS INFORMATION</td>
<td>7</td>
</tr>
<tr>
<td>APMC 2006 PRIZE</td>
<td>7</td>
</tr>
<tr>
<td>TECHNICAL SESSION</td>
<td>8</td>
</tr>
<tr>
<td>OPEN FORUM</td>
<td>20</td>
</tr>
<tr>
<td>WORKSHOP</td>
<td>25</td>
</tr>
<tr>
<td>SHORT COURSE</td>
<td>30</td>
</tr>
<tr>
<td>EXHIBITION</td>
<td>31</td>
</tr>
<tr>
<td>APMC 2006 COMMITTEE OFFICERS</td>
<td>34</td>
</tr>
</tbody>
</table>
Welcome to Yokohama and the 2006 Asia-Pacific Microwave Conference (APMC 2006). The Yokohama Bay Area is faced on the southwest coast of Tokyo Bay and lies about 30 km south of Tokyo. In the neighborhood of the city, there are many companies and laboratories dealing with microwave and related industries.

APMC 2006 is the 18th APMC, which started in 1986 in India, and the 5th to be held here in Japan. During that time, Microwave technologies made remarkable progress supported by civilian demands. We hold the conference under the theme of “Sail for the Microwave Ocean” at Yokohama, one of the eminent harbor towns in Japan.

APMC 2006 will be held at the Conference Center in Pacifico Yokohama, one of the largest convention centers in the world, located in the east coast of Yokohama. The details are given in this brochure.

At the Exhibition Hall adjacent to the Conference Center, an exhibition called “Microwave Exhibition 2006” will be held from December 13 to 15 as the part of APMC 2006. More than 300 companies dealing with Microwave and related industries will participate in this exhibition, not only from Japan and the United States but also from all over the world. Technical Seminars about new technologies and products will be held. To add to all of this, an exhibition of Japanese microwave history and another exhibition by the universities and colleges will be held in the same hall.

While you are here for APMC 2006, you can visit the surrounding area. Yokohama is very famous for Chinatown, one of the biggest in Japan. To the south of Yokohama, there is Kamakura, a historical and cultural city as there was shogunal government from 1192 to 1333, where you can enjoy old shrines and temples.

I wish you will join APMC 2006 and sail for a wonderful voyage at the Microwave oceans, sailing into the brilliant future.

Masayoshi Aikawa
APMC 2006 Steering Committee Chair

On behalf of the Technical Program Committee, I cordially welcome you to APMC 2006 in Yokohama.

The 2006 APMC Technical Program Committee has organized a highly qualified and exciting program covering wide varieties of microwave technologies and related fields.

This year, a total of 694 papers from 42 countries were submitted to APMC 2006, which is the largest number in APMC's history held in Japan. Due to the high professional quality of these papers, it was an extremely difficult task for the Technical Program Committee to select the 498 papers (312 for oral presentations, 186 for open forums), the maximum allowable number in this location and this period, with 192 reviewers around the world participating in the paper review and selection processes.

The technical activities begin at 9:00 a.m., on Tuesday, December 12, with workshops and short courses, which have been selected from the most exciting topics in our fields. This year there are 12 workshops and 4 short courses. APMC regular sessions commence at 8:50 a.m., on Wednesday, December 13, with 6 sessions proceeding simultaneously. A total of 66 oral presentation sessions and 3 open forum sessions are scheduled for paper presentations. The plenary session is scheduled at 10:40 a.m. on Wednesday, December 13, where Mr. Toshio Miki, NTT DoCoMo Inc. will present Keynote Address entitled “Mobile Communication Evolution”. And Prof. Tatsuo Itoh, UCLA will present “New Avenues of Microwave Component Design” as well. This year we have also invited 18 outstanding speakers who are very active in their field.

The Technical Program Committee has worked hard to make APMC 2006 successful and memorable. I would like to express my sincere appreciation to the members and reviewers of the Technical Program Committee for their dedication in organizing the technical program. We are looking forward to meeting you at the conference.

Kiyomichi Araki
Technical Program Committee Chair
GENERAL INFORMATION

CONFERENCE SITE

The APMC 2006 will be held from December 12 to 15 at the Conference Center in Pacifico Yokohama. Pacifico Yokohama is one of the largest convention centers in the world, consisting of the Conference Center, the Exhibition Hall, a hotel and a big national hall, and is located in the Minato Mirai 21 (MM21) area of Yokohama (see the map on the back cover). Its beautiful shell–and–sail–shaped appearance is impressive when viewed from sea and from land as well.

The conference will be held in the Conference Center: 2nd Floor Entrance Hall for Registration; 3rd Floor Meeting Rooms and Lounge for Technical Sessions, Workshops and Short Courses; and 5th Floor Meeting Rooms for the Opening Ceremony and Keynote Address.

YOKOHAMA

Yokohama faces the western coast of Tokyo Bay and lies mere 30 kilometers from Tokyo. The port of Yokohama, a naturally blessed harbor surrounded by gently undulating hills, opened in 1859, and ever since has played a major role as the window to the world. Japan’s first Western style hotel and restaurant were opened in Yokohama, and the city was also the site of Japan’s first coffee shop and bakery as well as its first modern waterworks and railroads. Yokohama, built on its rich heritage of enterprising endeavor, has become a truly international city and Japan’s largest international trading port.

Yokohama has a host of exciting places to visit. You can savor various works of art, familiarize yourself with Yokohama’s history and culture. Red Brick Warehouse Park is one of such visiting spots, for example. Lovely red brick buildings with their original facades (about 100 years old) have been refurbished from top to bottom. In these buildings, there is a hall, multipurpose space, a restaurant with live performances, a beer garden, and 31 shops selling a variety of food and goods. Outside the building, you can relax with greenery and trees.

To the south lies Kamakura, once the political and cultural capital of the Shogunate, from 1192 to 1333. It boasts a heritage comparable with that of Kyoto and Nara. You can experience the charm of many ancient temples and shrines, including the famous Great Buddha statue. It can be reached by train in 30 min from Yokohama.

REGISTRATION

Pre-registration is accepted only through APMC 2006 Web site (http://www.apmc2006.org) from July 31 to November 30, 2006. All the technical session speakers are requested to pre-resister by September 15, by declaring the “Presentation No. (e.g.: WE1A-1)” informed in the Notification of Acceptance on August 1.

After November 30, all registration will be accepted at the conference site, Pacifico Yokohama, Yokohama, Japan, from December 11 to 15, 2006.

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<tr>
<td>Conference Fee*1</td>
<td>42,000 JPY</td>
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<td>Workshops and Short Courses Fee*4</td>
<td>5,000 JPY</td>
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*1. The Conference Fee covers all the technical sessions from December 13 to 15, but does not cover the Workshops and Short Courses on December 12. This fee also covers other events such as the Opening Ceremony, Welcome Reception, Banquet, and the Registration Kit. The kit includes a nameplate, a conference bag, and a copy of the Conference Proceedings and the CD-ROM.

*2. We will prepare a different type of nameplate for students. The definition of “student” is as follows: a person who is attending graduate school, university, junior college, technical college, or similar educational institution as of December 12. Please show your student ID at the registration desk. Without an ID, you will have to pay extra fee to make up the difference.

*3. The definition of “retiree” is as follows: a person who is attaining the age of 60 years and not gainfully employed as of December 12, 2006.

*4. The Workshops and Short Courses Fee covers all the Workshop and Short Course sessions on December 12, but does not cover any other technical session or event in APMC 2006. Each registrant for Workshops and Short Courses will receive a copy of the Digest, which includes presentation materials for the Workshops and Short Courses.

If you are not going to participate in the Conference from December 13 to 15, please register for Workshops and Short Courses onsite on December 12, not by pre-registration.

Payment

The payment is accepted only by “Credit Card” in principle.

Accompanying Person

Each participant in the Conference from December 13 to 15 (except “Student”) can bring one of her/his family members as an Accompanying Person, who can participate in the Welcome Reception (free of charge), the Opening Ceremony, Banquet (free of charge), Tea Ceremony (1,000 JPY), and the Technical Sessions. The accompanying person will receive a nameplate, but not a copy of the Conference Proceedings.

Cancellation

In the event of the cancellation, written notification should be sent to Prof. Masayoshi Aikawa, Chair of the Steering Committee, before October 31, 2006, Japan Standard Time. A cancellation fee of 5,000 JPY will be deducted from the refund. After October 31, 2006, no refund...
can be made and a copy of the Conference Proceedings will be sent to the registrant after the conference.

APMC 2006 Secretariat:
Prof. Masayoshi Aikawa [Chair, Steering Committee]
c/o Real Communications Corp.
3F Shimmatsudo S. Bldg., 1–409 Shimmatsudo,
Matsudo, Chiba 270–0034, Japan
E-mail: mweapmc@io.ocn.ne.jp

Registration Desk
The registration and information desk is located at the 2nd Floor Entrance Hall of Pacifico Yokohama Conference Center. It will be open during the following hours:

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<tr>
<th>Date</th>
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<tbody>
<tr>
<td>December 11</td>
<td>4:00 p.m.–7:00 p.m.</td>
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<tr>
<td>December 12</td>
<td>8:00 a.m.–6:00 p.m.</td>
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<td>December 13</td>
<td>8:00 a.m.–6:00 p.m.</td>
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<td>December 14</td>
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<td>December 15</td>
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HOTEL ACCOMMODATIONS
Rooms at nine hotels in Yokohama, which are accessible from/to Pacifico Yokohama, have been blocked. Reservations must be made through the web site for the hotel accommodations. Applications should be accompanied by the payment of the hotel accommodation with the handling charge of 525 JPY per request. No reservation will be confirmed in the absence of the payment.
GENERAL INFORMATION

OFFICIAL TRAVEL AGENT

JTB Metropolitan Corp. Group Tours Office Yokohama has been appointed as the official travel agent for the Conference and will handle hotel accommodations. Applications and Inquiries concerning hotel accommodations should be addressed to:

JTB Metropolitan Corp. Group Tours Office Yokohama Convention Desk
6F, Yasuda 6th Bldg. 3–29–1, Tsuruya-cho, Kanagawa-ku, Yokohama 221–0835, Japan
E-mail: jtb_convention@jtb.jp

Please contact to JTB for information on sightseeing tours as well.

YOUTH HOSTEL INFORMATION

Also, for those with very limited budget, you may want to contact directly with the below Youth Hostel, which is about a 15 minutes’ walk to the Convention site, Pacifico Yokohama.

Name : Kanagawa Youth Hostel
Address : 1 Momijigaoka, Nishi-ku, Yokohama-shi, Kanagawa-ken 220–0044
URL : http://www.jyh.or.jp/english/index.html

TRANSPORTATION

The closest airports to Yokohama are the international Narita Airport and the domestic Haneda Airport. Narita Airport, formerly also known as New Tokyo International Airport, is located in the city of Narita in Chiba Prefecture, about 60 km outside of Tokyo. There are heavy traffic jams in Tokyo and Yokohama area. Public transportation (railways and subways) networks are convenient. Purchase your ticket by cash using the machine at the entrance. For most trains no advance reservation is needed. However, for JR Shinkansen limited express (bullet trains), advance reservation is recommended in order to secure a seat.

Yokohama is served by four railway companies (JR East, Tokyu Railway, Keikyu Railway and Sagami Railway), a municipal subway line and a bus network. The city has two major railway stations: Yokohama Station and Shin-Yokohama Station (“New Yokohama Station”). Train lines of all four railway companies and the subway line pass through Yokohama Station, which is located in the city center. Shin-Yokohama Station, on the other hand, is located outside of the city center, about 10 minutes from Yokohama Station by the JR Yokohama Line or the municipal subway. The shinkansen stops at Shin-Yokohama Station.

The nearest station to Pacifico Yokohama is Minato Mirai Station on the Minato Mirai Line, two stops from Yokohama Station. The Minato Mirai Line is directly connected to the Tokyo Toyoko Line. It takes about 3 minutes and costs 180 JPY from Yokohama to Minato Mirai. Pacifico Yokohama is also conveniently accessed from Sakuragicho Station on the JR Keihin-Tohoku Line (Negishi Line) and the municipal subway. (See the map on the back cover.)

How to get to Yokohama from Narita Airport

By Japan Railways (JR):

The fastest option to get to Yokohama is the JR Narita Express (NEX), requiring roughly 90 minutes for the one way journey. All seats are reserved. The one way fare between Narita Airport and Yokohama Station is about 4,200 JPY. There is about one connection per hour.

The JR Sobu Line (Rapid Service) is a slower, but cheaper JR alternative to the Narita Express. It takes roughly two hours from Narita Airport to Yokohama Station and costs 1,890 JPY for the one way journey. There is about one connection per hour.

By Keisei and Keikyu Railways:

Take the Keisei Limited Express from Narita Airport to Aoto Station (60 minutes) and transfer to a Keikyu train to Yokohama (60 minutes). A second transfer of trains may be required at Shinagawa Station. The one way fare is 1,450 JPY. There are about three connections per hour.

By limousine bus:

Limousine buses to the Yokohama City Air Terminal (YCAT) near Yokohama Station depart Narita Airport every 20 to 30 minutes. The one way journey takes about 90 minutes and costs 3,500 JPY. In addition, there are direct limousine bus connections to several major hotels in Yokohama.

By taxi:

Since Narita Airport is located about 60 km outside of Tokyo, a taxi ride into central Tokyo is very expensive and not recommended to common travelers.

By rental Cars:

Rental cars are available at major railway stations and airports.

VISA REQUIREMENT FOR FOREIGN ATTENDEES

Citizens of other countries may have to carry a passport (valid for at least 6 months beyond the applicant’s intended period of stay in Japan) and a visa to enter Japan. Foreign participants should contact the Japan Embassy, Consulate, or Agency of Tourism in their home country AS SOON AS POSSIBLE to determine their particular visa requirements and time estimate for their visa applications. Participants requiring visas must initiate the application process well in advance of their departure date.

Some general information on visa application procedures can be found on the Japanese Government websites at
http://www.mofa.go.jp/j_info/visit/visa/index.html. Due to the complex nature of visa requirements, the APMC 2006 Committees CANNOT contact or intervene with any Japan Embassy or Consulate office abroad on your behalf. We advise you to contact the Consular Section of the Embassy or Consulate General of Japan in your country for more information and advice.

OTHER INFORMATION

Electricity
Electricity supply is 100 Volts/50 Hz in eastern Japan including the Yokohama area, and 100 Volts/60 Hz in western Japan.

Weather
Yokohama lies in the temperate zone and has four distinct seasons. December is the beginning of winter, when Yokohama is rather cold but rarely has snow. The temperature ranges between 4°C (39°F) and 12°C (54°F), averaging 8°C (46°F). Coats or sweaters are needed.

No Smoking Policy
Smoking is prohibited in the Conference Center except at limited smoking corners.

Currency
Japanese yen (JPY) is the only currency that is used at stores and restaurants. You can exchange foreign currencies for Japanese yen at foreign exchange banks and other authorized money exchangers by showing your passport. The exchange rate fluctuates daily.

Traveller’s Checks and Credit Cards
Since traveller’s checks are not common in Japan, you may use them only at major hotels and leading banks. Major credit cards, such as VISA, Master Card, AMEX, and JCB, can be used at restaurants, hotels, souvenir shops, etc.

Tipping
Tipping is not customary in Japan. For example, you do not need to tip waiters/waitresses at restaurants.

Rental Cars
Rental cars are available at major railway stations (e.g. Tokyo station) and airports (e.g. Narita airport).

Japanese Traffic
There are heavy traffic jams in Tokyo and Yokohama area. Public transportation (railways and subways) networks are convenient. Purchase your ticket by cash using the machine at the entrance. For most trains no advance reservation is needed. However, for JR Shinkansen limited express (Bullet train), advance reservation is recommended in order to secure a seat.

Internet connection
Internet connection through Wireless LAN and Ethernet cable will be available at the Conference Center. There is no charge for the service.

SOCIAL PROGRAM

The APMC 2006 will provide original and colorful events: Welcome reception, the Opening Ceremony, Tea Ceremony, and Banquet.

WELCOME RECEPTION AT “YOKOHAMA RED BRICK WAREHOUSES”
All the participants in the Conference (from December 13 to 15) are invited to the Welcome Reception to be held from 5:30 p.m. to 7:30 p.m. on Tuesday, December 12, at the historical “Yokohama Red Brick Warehouses”, located in the Yokohama seaside area, about a 15–20 minutes’ walk from Pacifico Yokohama. A free bus transportation service from Pacifico Yokohama will be available for all the Conference participants. A special performance will be given by the Yokohama Mandolin Club, organized by the city officers of Yokohama.

History of Yokohama Red Brick Warehouses:
The historical Yokohama Red Brick Warehouses were constructed between 1911 and 1913 as a symbol of the modernization and development of Yokohama. In 1994, work began on the restoration and revitalization of the buildings. After eight years, the valiant figure of these buildings, which withstood the Great Kanto Earthquake and the Second World War, has risen once again. With the restoration work, from the standpoint of the conservation of cultural treasures, while making as much use of the original as possible, advanced technology was also used, including earthquake resistance strengthening work, and repair work to the exterior walls and roofs.
OPENING CEREMONY

The APMC 2006 Opening Ceremony will be held from 10:40 a.m. to 12:50 p.m. in Room 501+502 (5th floor) of Pacifico Yokohama Conference Center on Wednesday, December 13. A declaration and brief report by the APMC 2006 Steering Committee Chair and congratulatory addresses by invited representatives of sponsoring organizations including IEEE MTT-S, URSI, EuMA are scheduled at the beginning of the ceremony. Then, we will have the Keynote Addresses given by Mr. Toshio Miki, Managing Director of Communication Device Development Department, NTT DoCoMo Inc., and Professor Tatsuo Itoh, UCLA. The respective titles of their talks are “Mobile Communication Evolution” and “New Avenues for Microwave Component Design”.

BANQUET

The APMC 2006 Banquet will be held from 6:30 p.m. to 8:40 p.m. on Thursday, December 14, in the 3rd-floor Grand Ballroom of the Inter Continental The Grand Yokohama adjacent to the Conference Center. With a variety of cuisine, the banquet will introduce winners of Japan Microwave Prize. The Banquet will be a buffet style so that all the participants in the Conference (from December 13 to 15) are invited. After the greetings by the Conference Chair, you will experience the ceremony “Kagamiwari”, where a large barrel of sake (Japanese rice-wine) is cracked on the top with wooden hammers to celebrate the success of APMC 2006. The APMC 2006 Microwave Prize will be given to the winners selected by the Prize Committee from all participants presenting a paper at the conference. As special entertainment, the Banquet will feature a professional performance of traditional Japanese drums called “Taiko”. Taiko practitioners have been instrumental in introducing Japanese traditional culture worldwide, and the performances are said to convey heart to heart the spirit of Japan.

TEA CEREMONY

Would you like to enjoy a tea ceremony between your busy sessions or exhibitions? The tea ceremony will be held for all APMC 2006 participants. Ladies wearing Japanese traditional kimonos will serve you a bowl of green tea “maccha” and a Japanese-style confection “okashi”. You will find the atmosphere of the tea ceremony comfortable and relaxing — the gentle bubbling sound of water in a teakettle, the fragrance of incense, the lovely flower arrangements, and the artistic calligraphy on a scroll hanging in the alcove. The Way of Tea ceremony “茶の湯 = Chanoyu” is a Japanese cultural tradition. In the 16th century, Tea Master Rikyu Sen established the foundations of “Chanoyu”, where one respects everyone without distinction of status or rank. That is, the spiritual aspect is the most important in “Chanoyu”. The culture of “Chanoyu” has greatly influenced various aspects of Japanese culture, such as architecture, gardening, textiles, food, and cooking. You can experience the entire process of “Chanoyu” in a hiroma (tatami-mat room) as shown in the photo 1. For those who prefer a more casual style, ryurei-seki (a less formal tea ceremony with tables and chairs) will also be offered for your comfort.

It is our pleasure that we provide you with everything you need to relax at the tea ceremony room.

Date: Thursday, December 14, 2006
Time: 12:00 p.m. – 4:00 p.m.
Place: Tea ceremony room “Kaiko-an”, 65F, Yokohama Royal Park Hotel in Landmark Tower
Tickets: 1,000 JPY per person at the registration desk
MEETINGS INFORMATION

IEEE MTT-S REGION 10 CHAPTER CHAIR’S MEETING

The IEEE MTT-S Region 10 Chapter Chair’s Meeting will be held on Wednesday, December 13, 2006, from 1:00 p.m. to 2:00 p.m., at Room 211+212.

APMC INTERNATIONAL STEERING COMMITTEE MEETING

The APMC International Steering Committee Meeting will be held on Thursday, December 14, 2006, from 12:00 p.m. to 3:00 p.m., at Room 211+212.

APMC 2006 PRIZE

Papers presented at APMC 2006 will be judged by the APMC 2006 Prize Award Committee, and the authors of selected papers will be awarded the APMC 2006 Prize for outstanding contributions to the microwave field.

In addition, outstanding student papers submitted at the conference will be awarded the APMC 2006 Student Prize. These Prizes, which consist of the commemorative certificates and rewards, will be presented to all recipients at the APMC 2006 Banquet to be held on Thursday, December 14, 2006.
Wednesday, December 13 8:50 a.m. – 10:30 a.m.

Room A (301)  Session WE1A

Microwave Control and Frequency Conversion Circuits

Chairs: H. Okazaki, NTT DoCoMo, Inc., JAPAN
K. Miyaguchi, Mitsubishi Electric Corp., JAPAN

WE1A-1
38-80 GHz SPDT Traveling Wave Switch MMIC Utilizing Fully Distributed FET
H. Mizutani, N. Iwata, Y. Takayama*, and K. Honjo**, NEC Electronics Corp., *Univ. of Ryugy, **The Univ. of Electro-Communications, JAPAN

WE1A-2
A High Power CMOS SP4T Switch Using a Switched Resonator for Dual Band Applications

WE1A-3
A Q-Band Miniature Monolithic Subharmonically Pumped Resistive Mixer
S.-Y. Chen, J.-H. Tsai, P.-S. Wu, T.-W. Huang, and H. Wang, National Taiwan Univ., TAIWAN

WE1A-4
Tunable Coplanar Filter for F-Band Wireless Receivers

WE1A-5
Voltage Controlled Phase Shifters on CMOS Technology
G. Mascarenhas***, J. Caldeira Var**, and J. Costa Freire**, *ISEC MAR, REP, DE CABO VERDE, **Instituto de Telecomunicacões, Instituto Superior Técnico, PORTUGAL

WE1A-6
Analysis and Optimization of Ultra-Wideband Bandpass Filters on Coplanar Waveguide
J. Gao and L. Zhu, Nanyang Technological Univ., SINGAPORE

WE1A-7
Ultra-Wideband (UWB) Bandpass Filters with Improved Upper-Stopband Performance
S. W. Song, S. Sun, L. Zhu, and Z. N. Chen*, Nanyang Technological Univ., *Institute of Infocomm Research, SINGAPORE

WE1A-8
A Novel Ultra Wideband Bandpass Filter Using Microstrip Double-Ring Resonators

WE1A-9
Modeling of an Ultra-Wideband Bandpass Filtering Structure
K. Li and J.-S. Hong*, NICT, JAPAN, *Heriot-Watt Univ., U.K.

WE1A-10
An Ultra-Wideband (UWB) Bandpass Filter Using Broadside-Coupled Structure and Shunt Stub with Chip Capacitor
K. Li, Y. Yamamoto*, T. Matsui, and O. Hashimoto*, NICT, *Aoyama Gakuin Univ., JAPAN

Wednesday, December 13 10:50 a.m. – 12:50 p.m.

Room B (302)  Session WE1B

Ultra-Wide Band Planar Filters (1)

Chairs: I. Awai, Ryukoku Univ., JAPAN
J.-K. Rhee, Dongguk Univ., KOREA

WE1B-1
Analysis and Optimization of Ultra-Wideband Bandpass Filters on Coplanar Waveguide
J. Gao and L. Zhu, Nanyang Technological Univ., SINGAPORE

WE1B-2
Ultra-Wideband (UWB) Bandpass Filters with Improved Upper-Stopband Performance
S. W. Song, S. Sun, L. Zhu, and Z. N. Chen*, Nanyang Technological Univ., *Institute of Infocomm Research, SINGAPORE

WE1B-3
A Novel Ultra Wideband Bandpass Filter Using Microstrip Double-Ring Resonators

WE1B-4
Modeling of an Ultra-Wideband Bandpass Filtering Structure
K. Li and J.-S. Hong*, NICT, JAPAN, *Heriot-Watt Univ., U.K.

WE1B-5
An Ultra-Wideband (UWB) Bandpass Filter Using Broadside-Coupled Structure and Shunt Stub with Chip Capacitor
K. Li, Y. Yamamoto*, T. Matsui, and O. Hashimoto*, NICT, *Aoyama Gakuin Univ., JAPAN

Wednesday, December 13 10:50 a.m. – 12:50 p.m.

Room C (303)  Session WE1C

Biomedical Applications and EMC

Chairs: Y. Nikawa, Kokushikan Univ., JAPAN
J. G. Yook, Yonsei Univ., KOREA

WE1C-1
Non-Invasive Measurement of Blood Sugar Level by Reflection of Millimeter-Waves
Y. Nikawa and T. Michiyama, Kokushikan Univ., JAPAN

WE1C-2
Sub-μW Signal Power Doppler Radar Heart Rate Detection
S. Yamada, M. Chen, and V. Lubecke, Univ. of Hawaii at Manoa, U.S.A.

WE1C-3
Analysis of Aperiodic EBG Structures for Suppression of Ground Bounce Noise

WE1C-4
Reduction Effect of Ground Patterns on Conductive Noise Currents from Printed Circuit Board
T. Maeno***, T. Usoro*, K. Ichikawa*, and O. Fujikawa**, ***DENSO Corp., **Nagoya Institute of Technology, JAPAN

WE1C-5
Wave Absorber Based on Reinforced Plastic with Periodic Lattice for Improving ETC Environment

Opening Ceremony

Keynote Addresses (1): Mobile Communication Evolution

Speaker: Toshio Miki, Managing Director of Communication Device Development Department, NTT DoCoMo Inc., Japan

Abstract:

With the growing demand for high-speed and high-capacity data transmission in mobile communications, DoCoMo launched 3rd generation (3G) cellular systems “FOMA” with the maximum data rate of 384 kbps in 2001. DoCoMo proposed the “Super 3G concept” as the long-term evolution of 3G after the global deployment of 3G. This is because the long-term evolution of 3G is constitutive for 3G system to keep a highly competitive position. Super 3G also enables a smooth migration path towards 4th generation (4G) aiming at the target data rate; e.g. 100 Mbps at high mobility and 1 Gbps at low mobility.

Besides higher data rate, future mobile services will promote a ubiquitous communications environment in which all kinds of devices and objects are interconnected to attain real space and virtual space interaction. They are expected to facilitate the development of the so-called “mobile ubiquitous world”. In a mobile ubiquitous world, all kinds of things will be interconnected as needed to form ubiquitous networks that should arise frequently and simultaneously while changing continuously.

This speech presents the current status of the 3G services, views on the migration scenario from 3G to 4G, and research activities for achieving 4G services and mobile ubiquitous world.

Toshio Miki is the Managing Director of Communication Device Development Department, NTT DoCoMo Inc. since July 2006. Mr. Miki was born in Osaka, Japan, on March 5, 1956. He received the B.S. and M.S. degrees in electronics engineering from Kyoto University, Kyoto, Japan, in 1978 and 1980, respectively. Since 1980, he has been with the Research Labs. of NTT and NTT DoCoMo. He was a residential researcher of AT&T Bell Labs. in 1988. From 1999 through 2003, he was the founding President & CEO of DoCoMo Communications Laboratories USA Inc. After that, he was the managing Director of Multimedia Labs. in 2004, and Wireless Labs. in 2005.

From 1977 to 1984, he was engaged in the research of digital mobile communication technologies, in particular, modulation/demodulation and diversity reception. He started the research of speech coding in 1985, aiming for PDC (Japanese Digital Cellular Systems). His proposal, PSICELP, was standardized and widely used as PDC half-rate speech codec. He extended his research field to audio-visual coding in 1994, such as MPEG-4 and relevant ITU-T standards. He had been a member of ARIB STD-27 CODEC WG from 1991 through 1995 for the work of PDC half-rate speech coding standardization.

From 1995 through 1999, he served as the MPEG-4 subcommittee chairman of Japanese National Body. He also served as the Co-Chairman of the Video Verification Tests Ad-Hoc Group and the Audio Error Resilience Ad-Hoc Group in MPEG.

From 2002 through 2004, he was a trustee of ISOC (Internet Society). Mr. Miki was awarded the IEEE Vehicular Technology Society Paper Achievement Award of IEICE in 1992. He is a senior member of IEEE, and a member of IEICE of Japan, IPSCI, and ISOC.
TECHNICAL SESSION

8:50 a.m. – 10:30 a.m. Wednesday, December 13

Room D (304)
Session WE1D
Microstrip Patch Antennas
Chairs: K. Y. Yazdandoost, NICT, JAPAN
K.-M. Luk, City Univ. of Hong Kong, CHINA

WE1D-1
A New Single-Feed Proximity Coupled Circularly Polarized Square Ring Antenna
K.-F. Tong, Univ. College London, U.K.

WE1D-2
Gain-Enhanced Slot Antenna Fed by Conductor-Backed Coplanar Waveguide
I.-C. Lan and P. Hsu, National Taiwan Univ., TAIWAN

WE1D-3
Polarization Controllable Microstrip Antenna Using Beam Lead PIN Diodes
E. Nishiyama and M. Aikawa, Saga Univ., JAPAN

WE1D-4
A Wideband Circularly Polarized Reconfigurable Patch Antenna Excited by L-shaped Probes
S. S. L. Yang and K. M. Luk, City Univ. of Hong Kong, CHINA

WE1D-5
Unidirectional Antenna Composed of a Planar Dipole and a Shorted Patch
H. Wong and K.-M. Luk, City Univ. of Hong Kong, CHINA

Room E (311+312)
Session WE1E
Microwave Photonics and Optical Fiber Systems
Chairs: Y. Horiuchi, KDDI Lab., JAPAN
J. H. Tarng, National Chiao Tung Univ., TAIWAN

WE1E-1
Proposal of New Optical CDMA Systems and Fast Code Acquisition Techniques

WE1E-2
Low-Cost Radio-Over-Fiber in-building Distribution Network for WLAN, UWB and Digital TV Broadcasting
M. Yee, L. Michael Ong, C. Sim, and L. Bin, Institute of Infocomm Research, SINGAPORE

WE1E-3
A Study on a Long-Distance Transmission of Terrestrial Digital TV Signal Using Optical Fibers
K. Haeiwa, Y. Toba*, M. Onizawa*, and M. Nakamura**, Hiroshima City Univ., *NEC TOKIN Corp., **NHK, JAPAN

WE1E-4
Tunable and Configurable Photonic Microwave Bandpass Filter Implementated in a Radio-over-Fiber Link
X. Yu, X. Zheng, and H. Zhang, Tsinghua Univ., CHINA

WE1E-5
Analysis of The Guided Modes in Photonic Bandgap Fiber Using Compact 2D-FDTD Method
J.-J. Wu, R.-J. Li, T.-J. Yang, and J.-H. Tarng, WuFu Rd., TAIWAN

Room F (313+314)
Session WE1F
Scattering
Chairs: A. Matsushima, Kumamoto Univ., JAPAN
L.-W. Li, National Univ. of Singapore, SINGAPORE

WE1F-1
AIM Analysis of Electromagnetic Transmission Through Dielectric Radomes
W.-B. Ewe, E.-P. Li, and L.-W. Li*, Institute of High Performance Computing, *National Univ. of Singapore, SINGAPORE

WE1F-2
A Spectral Two-Step Preconditioner for Efficient Solution of EFIE in The FMM Context
P. L. Rui and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

WE1F-3
Low Grazing Incident Effects from Rough Surface

WE1F-4
Localization of Electromagnetic Radiating Sources in the Near-Field of a Uniform Circular Array
M. J Abedin and A. Sanagavarapu Mohan, UTS, AUSTRALIA

WE1F-5
Application of BiCG+FFT Techniques to Solution of Large-Scale Electromagnetic Inverse Problems
J.-L. Hu, Northwestern Polytechnical Univ., CHINA

10:50 a.m. – 12:50 p.m. Wednesday, December 13

Keynote Addresses (2): New Avenues for Microwave Component Design
Speaker: Tatsuo Itoh, Professor of UCLA, U.S.A.

Abstract:
This talk will present a subjective view for emerging microwave component and circuit designs deviating from traditional approaches. First, a trend started about 10 year ago is a global design in which active device characterizations are combined with passive circuit and electromagnetic analysis. Second and more recent trend is to take into account the propagation aspects of the communication channel into hardware design. The third is the dispersion engineering recently coming to greater recognition by the emergence of metamaterials.

Tatsuo Itoh is Professor of Electrical Engineering and holder of the Northrop Grumman Endowed Chair in Microwave and Millimeter Wave Electronics at UCLA. He is a Fellow of the IEEE, served as the Editor of IEEE Transactions on Microwave Theory and Techniques, President of the MTT Society and Editor-in-Chief of IEEE Microwave and Guided Wave Letters. He was elected as an Honorary Life Member of MTT Society in 1994. He received a number of awards including IEEE Third Millennium Medal and IEEE MTT Distinguished Educator Award. He is a member of National Academy of Engineering. He has over 1000 publications and generated 65 Ph.D.’s.
JAPAN
Shorting Strip
M. Yassir, Y. Kimura, and M. Haneishi,
Antenna
A Consideration On A Beam Adjustable Microstrip Array
WE4D-5
Tsinghua Univ., CHINA, *NEC Corp., JAPAN
J. Sun, W. Chen, X. Wang, Z. Feng, Y. Furuya*, and A.
Antenna System
Realization and Measurements of Planar Switchable
WE4D-4
Tsinghua Univ., CHINA, *NEC Corp., JAPAN
Design of Compact Switched Slot Antenna
WE4D-3
KAIST, *Wiworld Co., Ltd., KOREA
K.-S. Son, S.-Y. Hwang*, C.-G. Park*, and J.-W. Yu,
Both RHCP and LHCP Using Single Layer Polarizer
Waveguide Slot Array In-Motion Antenna for Receiving
WE4D-1 (INVITED)
: K. Nishizawa,
Reconfigurable Antennas
Conference of the National Academy of Sciences of Ukraine, UKRAINE
M. K. Huang and T. Chiu, National Central Univ., TAIWAN
K. Huang and T. Chiu, National Central Univ., TAIWAN
K.-J. Kim and K.-H. Park,
Plane
System with the Small N-Section Resonators on the Ground
WE3D-3
K. Huang and T. Chiu, National Central Univ., TAIWAN
K. Huang and T. Chiu, National Central Univ., TAIWAN
K. Huang and T. Chiu, National Central Univ., TAIWAN
Planar Inverted-F Antenna with Folded Capacitive Feed Structure
WE3D-5
Y. Ding and Z. Du, Tsinghua Univ., CHINA
Planar Inverted-F Antenna with Folded Capacitive Feed Structure
WE3D-5
Y. Ding and Z. Du, Tsinghua Univ., CHINA
Design of an Enhanced Bandwidth PIFA with Modified Shorting Strip
WE3D-4
Design of an Enhanced Bandwidth PIFA with Modified Shorting Strip
WE3D-4
Design of an Enhanced Bandwidth PIFA with Modified Shorting Strip
WE3D-4
Design of an Enhanced Bandwidth PIFA with Modified Shorting Strip
WE3D-4
TECHNICAL SESSION

Thursday, December 14
8:50 a.m. – 10:30 a.m.

Session TH1A
Microwave Oscillator

Chairs: T. Tokumitsu, Eulyn Devices, JAPAN
K. Itoh, Mitsubishi Electric Corp., JAPAN

TH1A-1
Novel Methods for Phase Noise Reduction and Harmonic Suppression in a Planar Oscillator Circuit Based on Split Ring Resonators
C. G. Hwang and N. H. Myung, KAIST, KOREA

TH1A-2
Technological Scaling and Minimization of 1/f Noise in SiGe HBTs Coupled Mode N-Push Oscillator/VO
t and A. K. Poddar, Synergy Microwave Corp., U.S.A.

TH1A-3
A Ku-Band Push-Push VCO Using Phase Shifters
M. Tsutsumi, T. Tanaka, and M. Aikawa, Saga Univ., JAPAN

TH1A-4
A High-Efficiency GaN/AlGaN HEMT Oscillator Operating at L-Band

TH1A-5
PHEMT Balanced K-Band Doubler with Integrated Balun
W.-R. Lee, S.-F. Chao, Z.-M. Tsai, P.-C. Huang, C.-H. Lien, National Taiwan Univ., TAIWAN

Session TH1B
Advances in Tunable and Metamaterial Filters and Resonators

Chairs: M. Miyazaki, Mitsubishi Electric Corp., JAPAN
C. Quendo, LEST-UBO, FRANCE

TH1B-1
A Widely-Tunable Balanced Bandstop Filter with Low Reflections and Separate Stop-Bands

TH1B-2
Varactor-Tuned Hairpin Bandpass Filter with Enhanced Stopband Performance
M.-S. Chung, I.-S. Kim, and S.-W. Yun, Sogang Univ., KOREA

TH1B-3
Coupling Compensated 180° Phase Shift Coupled-Line Filters Terminated in Arbitrary Impedances
H.-R. Ahn, K. Min, D. Kang, S. Hong, and B. Kim, POSTECH, KOREA

TH1B-4
Piezoelectric-Based Tunable Microstrip Shunt Resonator
M. Al-Ahmad, N. Rolland, and P.-A. Rolland, IEMN, FRANCE

TH1B-5
CPW Zeroth Order Resonator (ZOR) : Experimental Demonstration of Insensitivity to Losses and to Size
S. Abielmona, H. V. Nguyen, and C. Caloz, École Polytechnique de Montréal, CANADA

Thursday, December 14
10:50 a.m. – 12:30 p.m.

Session TH2A
Frequency Multiplication and Conversion Circuits

Chairs: N. Itoh, Toshiba Corp., JAPAN
K. Nishikawa, NTJ, JAPAN

TH2A-1
A High Performance Ka-Band Push-Push Oscillator Using Finite Ground CPW Structure
Y.-L. Zou and H.-K. Chou, National Central Univ., TAIWAN

TH2A-2
A 1V 50 GHz Digital-Controlled CMOS Frequency Divider
S.-Y. Bai, T.-N. Luo, and Y.-J. Emery Chen, National Taiwan Univ., TAIWAN

TH2A-3
Multi-Port Admittance-Matrix

TH2A-4
A High-Efficiency, Broadband and High Output Power PHEMT Balanced K-Band Doubler with Integrated Balun
W.-R. Lee, S.-F. Chao, Z.-M. Tsai, P.-C. Huang, C.-H. Lien, J.-H. Tsai, and H. Wang, National Taiwan Univ., TAIWAN

TH2A-5
A Passive Frequency Tripler Using the New Small-Size Bandpass Filter with Low Insertion Loss

Session TH2B
Design and Implementation Techniques for Microwave Filters

Chairs: K. Suzuki, ISTEC, JAPAN
O. Bartz, Panasonic Electronic Devices Europe GmbH, GERMANY

TH2B-1
Efficient Time Domain Calculus of Microwave Resonator Parameters
I. Awai, T. Ishida, and Y. Zhang, Ryukoku Univ., JAPAN

TH2B-2
Full Wave Coupled Resonator Filter Optimization Using a Multi-Port Admittance-Matrix
S. Otto, A. Lauer, J. Kassner, and A. Rennings, IMST GmbH, GERMANY

TH2B-3
Compact Combline Filter with Improved Cross Coupling Assembly and Temperature Compensation
M. Hoff, S. Burger, T. Magath, and O. Bartz, Panasonic Electronic Devices Europe GmbH, GERMANY

TH2B-4
A 5GHz 5-pole NRD Guide E-Plane Bandpass Filter for Millimeter Wave OFDM Applications

TH2B-5
Ultra-Narrowband HTS Filter with 2.5-Wavelength Hairpin Resonators in 7 GHz Band
N. Shiosaka, H. Kayano, M. Yamazaki, T. Watanabe, F. Aiga, and T. Hashimoto, Toshiba Corp., JAPAN

Session TH2C
Advanced Coupler Design and Fabrication Techniques

Chairs: H. Oh-hashi, Mitsubishi Electric Corp., JAPAN
K. M. Cheng, The Chinese University of Hong Kong, CHINA

TH2C-1
CMRR Analysis for Wideband Passive Monolithic Differential Quadrature Coupler Implemented Using GaAs Process
K. W. Hamed, A. P. Freundorfer, and Y. M. M. Antar*, Queen’s Univ., *Royal Military College, CANADA

TH2C-2
High Compactness/High Isolation 3D-Broadside Couplers Design Methodology

TH2C-3
Non-Uniform Tapered Ultra Wideband Directional Coupler Design and Modern Ultra Wideband Balun Integration
P. Salem, C. Wu, and M. C. E. Yagoub, Univ. of Ottawa-SITE, *Defence R&D Canada, CANADA

TH2C-4
A CPW Hybrid Coupler with an Enhanced Coupling Microstructure
Y. Kikutaka, M. Hangan, S.-S. Lee, T. Nishino, Y. Yoshida, and M. Miyazaki, Mitsubishi Electric Corp., JAPAN

TH2C-5
Monolithic Integration of Microstrip Line Couplers for Automotive Radar Applications at 77 GHz Using A Si-HBT Technology
M. Hartmann, K. Seemunni, M. Jaeger*, E. Kollmohler*, and R. Weigel, Univ. of Erlangen-Nuremberg, GERMANY, *Danube Integrated Circuit Engineering, AUSTRIA
**TECHNICAL SESSION**

**Room D (304)**

**Session TH1D**

**Millimeter Wave and Integrated Antennas (1)**

*Chairs*: J. Hirokawa, Tokyo Institute of Technology, JAPAN K. Gohbarni, RMIT Univ., AUSTRALIA

**TH1D-1**

InP Aperture Coupled Patch Antenna for Millimeter-Wave/Photonic Integrated Circuits

W. S. T. Rowe and K. Gohbarni, RMIT Univ., AUSTRALIA

**TH1D-2**

Flip-Chip Bonded Stacked Patch Antenna for Monolithic Microwave Integrated Circuits

A. S. Elmouna and W. S. T. Rowe, RMIT Univ., AUSTRALIA

**TH1D-3**

Micromachined Inset-Fed Patch Antenna at Ka-Band

P. Sharma, S. S. Koul, and S. Chandra, Indian Institute of Technology, INDIA

**TH1D-4**

Ultrawide-Band Integrated Circuit Package Antenna in LTCC Technology

M. Sun and Y. P. Zhang, Nanyang Technological Univ., SINGAPORE

**TH1D-5**

Electromagnetic Radiation of Carbon Nanotube Array in Microwave Frequencies

Q. Zhu, Univ. of Science and Technology of China, CHINA

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**Room E (311+312)**

**Session TH1E**

**Advanced High Power Amplifiers**

*Chairs*: K. Maruhashi, NEC Corp., JAPAN H.-K. Chiou, National Central Univ., TAIWAN

**TH1E-1**

A Family of 20 W Linear Driver ICs for RF High Power Amplifiers


**TH1E-2**

Closed-Loop Power Control of Radio Frequency Power Amplifier Module with an on-Chip Embedded Power Detector


**TH1E-3**

1.5 kW, S-Band Solid-State Pulsed Power Amplifier with Digitally Controlled Automatic Gain Equalizer Circuit


**TH1E-4**

Ka-Band Flip-Chip Assembled Power Amplifier


**TH1E-5**

A 26 ~ 65 GHz GaAs pHEMT Cascaded Single Stage Distributed Amplifier with High Gain/Area Efficiency

K.-Y. Lin, I.-S. Chen, and H.-K. Chou, National Central Univ., TAIWAN

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**Room F (313+314)**

**Session TH1F**

**Numerical Analysis**

*Chairs*: K. Nishimura, Ryukoku Univ., JAPAN J. Rautio, Sonnet Software, Inc., U.S.A.

**TH1F-1**

Exact Calibration of Multiple Coupled Internal Ports in Electromagnetic Analysis

J. C. Rautio, Sonnet Software, Inc., U.S.A.

**TH1F-2**

Application of Stopband of Composite Right/left-Handed Transmission Line for Broadband Power Divider Design

K.-H. Tsai and C.-K. Tsang, National Taiwan Univ., TAIWAN

**TH1F-3**

An Efficient Variant of GMRES Iterative Method for FMM Implementation

P. L. Rui and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

**TH1F-4**

The Multigrid Preconditioned Flexible GMRES Solver for Hierarchical TVFEM Analysis

X. W. Ping and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

**TH1F-5**

The Application of p-Level Schwarz Method for Simulation of Electromagnetic Problems with FEM

X. W. Ping and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

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**Room D (304)**

**Session TH2D**

**Millimeter Wave and Integrated Antennas (2)**

*Chairs*: H. Satoh, Tohoku Univ., JAPAN K. Eccleston, Univ. of Canterbury, NEW ZEALAND

**TH2D-1**

Design of Millimeter-Wave Microstrip Comb-Line Antenna Array Beam-Tilting in Perpendicular Plane of Feeding Line

Y. Kashino, K. Sakakibara, Y. Tanaka*, N. Kikuma, and H. Hirayama, Tohoku Univ., JAPAN

**TH2D-2**

A Compact Cavity-Backed Annular Slot Array for 60-GHz Applications

K.-F. Hung and Y.-C. Lin, National Taiwan Univ., TAIWAN

**TH2D-3**

Slot Array Antennas Fed by Integrated Wave Guide on Liquid Crystal Polymer for V-Band Wireless LAN Application

I.-K. Kim, K.-S. Yang, S. Pinel, and J. Laskar, Georgia Institute of Technology, U.S.A.

**TH2D-4**

Measurements of a Compact Surface Wave Launcher Array with Application to Single Frequency Beam Steering Leaky Wave Antennas

A. P. Freundorfer, M. Z. I. Bekheit, and Y. M. M. Antar*, Queen’s Univ., *Royal Military College, CANADA

**TH2D-5**

Four-Way Power Combining Integrated Antenna

K. W. Eccleston, Univ. of Canterbury, NEW ZEALAND

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**Room E (311+312)**

**Session TH2E**

**Modulation and Related Technologies**

*Chairs*: H. Furuta, NHK, JAPAN W.-M. Woo, Samsung RFIC Design Center at Georgia Tech, U.S.A.

**TH2E-1**

Frequency and Power Saving of the Future Generation Wireless Communications by Superconducting Filter


**TH2E-2**

Neutrally Superseded M-Ary QAM wireless Communication System

M. Tanaka and T. Eguchi, Nihon Univ., JAPAN

**TH2E-3**

Evaluation of Millimeter-Wave MIMO-OFDM Transmission Performance in a TV Studio

S. Suzuki, T. Nakagawa, H. Furuta, and T. Ikeda, NHK, JAPAN

**TH2E-4**

Analytic Quantization Modeling of OFDM Signals Using Non-Gaussian Distribution

H. Ehm, S. Winter, and R. Weigel, Univ. of Erlangen-Nuremberg, GERMANY

**TH2E-5**

A Case Study on Frequency Reuse in OFDMA Systems Using a Hierarchical Resource Radio Resource Management

B. Roy, M. Einhaus*, and C. K. Roy, Queen’s Univ., CANADA, *RWTH Aachen Univ., GERMANY

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**Room F (313+314)**

**Session TH2F**

**Lossy Materials**

*Chairs*: S. Watanabe, Aoyama Gakuin Univ., JAPAN K. L. Wu, Chinese Univ. of Hong Kong, CHINA

**TH2F-1**

Radiation Characteristics of a Periodically Slotted Parallel Plate Waveguide Filled with a Transversely Magnetized Ferrite

K. Nishimura, Ryukoku Univ., JAPAN

**TH2F-2**

Physical Model Order Reduction for Multilayer Lossy RF Embedded Passives

H. Hu, J. Wang, and K.-L. Wu, the Chinese Univ. of Hong Kong, CHINA

**TH2F-3**

Study of Reflection Properties of Thin Slabs Based on Artificial Materials

A. Munir and H. Kubo, Yamaguchi Univ., JAPAN

**TH2F-4**

Guiding Modes of Electromagnetic Crystal Waveguides Consisting of Magnetized Ferrite

H. Jia and K. Yasumoto, Kyushu Univ., JAPAN

**TH2F-5**

Analytical Study of Temperature Distribution of One-Layer EM-Absorber Using a Lossy Dielectric Material

S. Watanabe, K. Satô, T. Kurakata, and O. Hashimoto, Aoyama Gakuin Univ., JAPAN
<table>
<thead>
<tr>
<th>Session A (301)</th>
<th>Session B (302)</th>
<th>Session C (303)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TH3A</strong></td>
<td><strong>TH3B</strong></td>
<td><strong>TH3C</strong></td>
</tr>
</tbody>
</table>
| **Linearization Technologies for Power Amplifiers**  
Chairs: T. Nojima, Hokkaido Univ., JAPAN  
Y.-H. Jeong, Pohang Univ. of Science and Technology, KOREA | **Advanced Divider Analysis and Designs**  
Chairs: I. Sakagami, Toyama Univ., JAPAN  
S. Kahng, Univ. of Incheon, KOREA | **Artificial and Novel Materials for Antenna Applications (1)**  
Chairs: T. Maruyama, NTT DoCoMo, Inc., JAPAN  
K. Eccleston, Univ. of Canterbury, NEW ZEALAND |
| **TH3A-1** | **TH3B-1** | **TH3C-1** |
| Pre-Distortion Linerarizer Using Self Base Bias Control Circuit  
L. Chiu and Q. Xue, City Univ. of Hong Kong, CHINA | Slotted Composite Right-Left-Handed Strip Lines for Leaky Wave Antenna Applications  
Y. Sasaki, A. Sanada, and H. Kubo, Yamaguchi Univ., JAPAN |
| **TH3A-2** | **TH3B-2** | **TH3C-2** |
| Series Anti-Parallel Diode Linearizer for Class-B Power Amplifiers with a Gain Expansion  
A. M. Abbosh**, **, M. E. Bulikowski, and J. Majerska**, **, Univ. of Queensland, AUSTRALIA,  
**Moss Univ., IRAQ, ***,Munster Univ., NEW ZEALAND | Electromagnetic Band Gap (EBG) Structure Synthesizer Using Genetic Algorithm for Wireless System Applications  
T. H. Kim, E. Engin, and M. Swaminathan, Georgia Institute of Technology, U.S.A. |
| **TH3A-3** | **TH3B-3** | **TH3C-3** |
| Linearity Improvement of RF Power Amplifiers Using a Simple High-Order Predistorter for WCDMA Applications  
Y.-S. Lee, K.-J. Jeon*, and Y.-H. Jeong, Pohang Univ. of Science and Technology, *RFcore Ltd., KOREA | A New Type of 3-Way Power Divider Using An Intentional Mismatched Termination  
J.-S. Bae, J.-S. Lim, K.-S. Kim, J. Kim, and D. Ahn, Soonchunhyang Univ., KOREA | Performance Evaluation of a Very Small Magnetic Core Loop Antenna for an LF Receiver  
K. Abe and J. Takada*, CASIO Computer Co., Ltd., *Tokyo Institute of Technology, JAPAN |
| **TH3A-4** | **TH3B-4** | **TH3C-4** |
| A Polar Function Linearizer Using Even Order Harmonic Eqs.  
K. Abe and J. Takada*, CASIO Computer Co., Ltd., *Tokyo Institute of Technology, JAPAN |
| **TH3A-5** | **TH3B-5** | **TH3C-5** |
| Adaptive Linearization Technique for a Multi-Port Amplifier  
F. Kuroki and H. Ohta, Kure National College of Technology, JAPAN |

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<table>
<thead>
<tr>
<th>Session A (301)</th>
<th>Session B (302)</th>
<th>Session C (303)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TH4A</strong></td>
<td><strong>TH4B</strong></td>
<td><strong>TH4C</strong></td>
</tr>
</tbody>
</table>
| **High Power Devices and Power Amplifiers**  
Chairs: M. Kuzuhara, Fuku University, JAPAN  
C.-S. Kwak, ETRI, KOREA | **Power Amplifiers and Linearization Technique**  
Chairs: T. Yoshimatsu, Waseda University, JAPAN  
L. Larson, Univ. of California, San Diego, U.S.A. | **Artificial and Novel Materials for Antenna Applications (2)**  
Chairs: A. Sanada, Yamaguchi University, JAPAN  
J. Modelski, Warsaw University of Technology, POLAND |
| **TH4A-1** | **TH4B-1** | **TH4C-1** (INVITED) |
| Numerical Analysis and IR Scan Test for Thermal Resistance of GaAs MMIC in a Communications Satellite  
C. S. Kwak, K. B. Ahn, D. P. Chang, and I. B. Yom, ETRI, KOREA | High Linearity-Wideband PHEMT Darlington Amplifier with +4 dBm IP3  
K. W. Kobayashi, Sirensa Microdevices, U.S.A. | **Semiconductor and Ferroelectric Antennas**  
J. Modelski and Y. Yashchyshyn, Warsaw University of Technology, POLAND |
| **TH4A-2** | **TH4B-2** | **TH4C-2** |
| A 2.4GHz Class-E LDMS Power Amplifier  
Y.-S. Lee, K.-J. Jeon*, and Y.-H. Jeong, Pohang Univ. of Science and Technology, *RFcore Ltd., KOREA | Development of an MCPA Using Digital Pre-Distortion for Digital Terrestrial TV Broadcasting  
K. Haeiwa, K. Kanamori*, and T. Abe*, Hiroshima City Univ., **NKY, JAPAN | Power Combining Oscillator Array Using Metamaterial Based Injection Locking Coupling Network  
| **TH4A-3** | **TH4B-3** | **TH4C-3** |
| Reduced Gate Leakage-Current and RF Power Performance of AlGaN/GaN HEMTs with an Inner Field-Plate  
K. Lee, K. Ko, S. Lee, and K. Yang, KAIST, KOREA | A Recursive Digital Predistorter for Linearizing RF Power Amplifiers with Memory Effects  
P. L. Gilabert, G. Montoro, and A. Cesari*, Universitat Politècnica de Catalunya, SPAIN, **LAA-CNRS, FRANCE | Design of an 8-Element Planar Composite Right/Left-Handed Leaky Wave Antenna Array for 2-D Beam Steering  
T. Kaneda, A. Sanada, and H. Kubo, Yamaguchi University, JAPAN |
| **TH4A-4** | **TH4B-4** | **TH4C-4** |
| Prospective and Issues for GaN Microwave Electronics into Space Satellites  
M. Helaoui**, **, S. Boumaiza*, A. Ghazel**, and F. M. Ghannouchi*, *Univ. of Calgary, CANADA, **Poly-Grammes Research Center, CANADA | On the Reduction of Mutual Couplings between Closely Separated Patch Antennas  
G. S. A. Shaker and S. Safavi-Naeini, Univ. of Waterloo, CANADA |
| **TH4A-5** (INVITED) | **TH4B-5** (INVITED) | **TH4C-5** |
| Recent Progress of High Power GaN HEMT for Wireless Application  
K. Joshin and T. Kikawa, Fujitsu Laboratories Ltd., JAPAN | Digital Predistortion Techniques for Linearized Power Amplifiers  
L. Larson, D. Kimball, P. Ashbeck, P. Draxler, J. Deng, and M. Li, Univ. of California, San Diego, U.S.A. | A Broadband Planar Patch Array Resonator Antenna  
D. Kim, M. Kim, M. Tanaka*, and K. Matsuogatani*, Korea Univ., KOREA, **DENSO Corp., JAPAN |
Session TH3D

Novel FDTD Method

*Universidad Politécnica de Madrid, SPAIN

In Microwave Frequency

J.-N. Hwang and F.-C. Chen, National Chiao Tung Univ., TAIWAN

TH3D-1 Effect of the Conductivity Profile on the Stability of the ADFI-FDTD Method with Split-Field PML

TH3D-2 Hybrid PML-ABC Truncation Techniques for Finite-Volume Time-Domain Simulations

K. Sakaran, C. Fumeaux, and R. Vahlhiedeck, ETH Zurich, SWITZERLAND

TH3D-3 A Novel Extended FDTD Method for the Analysis of the Active Integrated Circuit and Antenna Mounted Non-Linear Devices

N. Kawashima, K. Fujiyoshi, M. Sanagi, and S. Nogi, Okayama Univ., JAPAN

TH3D-4 An Efficient FDTD Algorithm for Computation of Resonance Frequencies of an Inhomogeneous Cylindrical Structure

K. V. Srivastava, V. V. Mishra, and A. Biswas, Indian Institute of Technology, INDIA

TH3D-5 Efficient Analysis of Resonator by the Three-Dimensional Iterative ADI-FDTD Method

Z. B. Ye and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

Session TH3E

Thermal Conductivity (1)

*Georgia Institute of Technology, U.S.A., *Hanbat National Univ., **National Chiao Tung Univ., TAIWAN

TH3E-1 A New Approach to Accurate Thermal Conductivity Measurement for High Power Silicon Device


TH3E-2 Dynamic Nonlinear Behavior Characterization for Wideband RF Transmitters Using Augmented Hammerstein Models

T. Liu, S. Boumaaza, A. B. Sesay, and F. M. Ghannouchi, Univ. of Calgary, CANADA

TH3E-3 Analog Integrator and Analog-to-Digital Converter Effect on a Multi-Resolution Spectrum Sensing (MRSS) for Cognitive Radio Systems


TH3E-4 A Study of Wireless Parallel Data Transmission of Extremely High Data Rate up to 6.17 Gbps per Channel

P. Håkansson, A. Huyhn, and S. Gong, Linköping Univ., SWEDEN

TH3E-5 Review of Helices for DTV Broadcast from Prototype HAPS Airship

D. Gray, M. Nagatsuma, and R. Miura, NICT, JAPAN

Session TH3F

Microwave Silicon VCO Design

*Georgia Tech., U.S.A., **Hanbat National Univ., KOREA

TH3F-1 A 5.5GHz, 8mW, LC Tank CMOS VCO with Optimal Phase Noise Performance


TH3F-2 Differential VCO Design with a Wide Frequency Tuning Range

L. Lin, W.-Y. Yin, J. Mao, and Y.-Y. Wang, Shanghai Jiao Tong Univ., CHINA

TH3F-3 A Low Noise Bulk-Coupled Colpitts CMOS Quadrature VCO

Y.-H. Cho, F.-C. Chang, M.-F. Lei, M.-D. Tsai, H.-Y. Chang, and H. Wang, National Taiwan Univ., TAIWAN

TH3F-4 Design of Low Power and High Efficiency Colpitts VCO with a Cascoded NMOS Cross-Coupled pair

C. S. Shie, J. L. Lin, and Y. C. Chiang, Chang Gung Univ., TAIWAN

TH3F-5 A 2.5 GHz CMOS LC VCO with Improved Phase Noise Based on the Transformer Feedback Scheme

Y. Hara, H. Sakurai, and Y. Sugimoto, Chuo Univ., JAPAN

Session TH4D

Waveguide Based on Metamaterials

Taiwan Tech., TAIVIAN

TH4D-1 Leaky Wave Radiation from Left-Handed Transmission Lines Composed of a Cut-off Parallel-Plate Waveguide Loaded with Dielectric Resonators


TH4D-2 Guided-Wave Characteristics of Coplanar Waveguide Metamaterials Composed of.Unsymmetrical Unit Cells

J. Gao and L. Zhu, Nanyang Technological Univ., SINGAPORE

TH4D-3 Metallic Wave Substrate (MWS) for Miniaturization in Planar Microwave Applications

H. V. Nguyen, J. Guvah, J. M. Fernandez*, M. S. Sierra-Calatayud*, and C. Caillet, École Polytechnique de Montréal, CANADA

TH4D-4 Parallel Conductor Particle for Artificial Magnetic Material in Microwave Frequency

H. Kubo, A. Matsumoto, and A. Sanada, Yamaguchi Univ., JAPAN

TH4D-5 Left-Handed Wave Propagation in Rod Media

A. Sanada, Yamaguchi Univ., JAPAN

Session TH4E

System-Related Technologies (2)

*Georgia Institute of Technology, U.S.A.*

TH4E-1 Dual-Mode & Dual-Band RF Module Designed Based on Homodyne Technology

Z. Jiang, J. Zhao*, and X. Zhu, Homodyne Technology, Dual-Mode & Dual-Band RF Module Designed Based on Homodyne Technology

TH4E-2 A Novel Linear Polar Transmitter Architecture Using Low-Power Analog Predistortion for EDGE Applications


TH4E-3 All-Microstrip Design of Three Multiplexed Antennas and LNA for UWB Systems

A. Serban, M. Karlsson, and S. Gong, Linköping Univ., SWEDEN

TH4E-4 Design and Characteristics of High Order Derivative Gaussian Pulse Generator for DS-UWB

D.-H. Kim, G.-N. Bang, and C. Park, Myongji Univ., KOREA

TH4E-5 The System Design of Integrated Passive Transponder Devices

K. Seemann and R. Weigel, Univ. of Erlangen-Nuremberg, GERMANY

Session TH4F

Silicon Frequency Generation and Conversion ICs

*National Taiwan Univ., TAIWAN

TH4F-1 A Double Tuned Ku-Band SiGe-MMIC VCO with Variable Feed-Back Capacitor

K. Tsutsui, M. Kajino, and N. Suematsu, Mitsubishi Electric Corp., JAPAN

TH4F-2 A Low Phase Noise 26-GHz Push-Push VCO with a Wide Tuning Range in 0.18-µm CMOS Technology


TH4F-3 A 16-GHz CMOS Differential Colpitts VCO for DS-UWB and 60-GHz Applications


TH4F-4 A 1.5-V 2.4-GHz CMOS Variable Gain Front-End for Bluetooth and Wireless LAN Applications

S. K. Alam, The Ohio State Univ., U.S.A.

TH4F-5 CMOS Devices and Circuits for Microwave and Millimetre Wave Applications

H. Zirath**, M. Fernhult, B. M. Moehl†, A. Maslou†, I. Angelov†, and B.-O. Veceño**, *Chalmers Univ. of Technology, **Ericsson AB, †Ericsson Microwave Systems, SWEDEN
**Friday, December 15**  
8:50 a.m. – 10:30 a.m.

### Room A (301)
#### Session A (FR1A)
**Advances on Passive Components**  
*Chairs*: A. Sanada, Yamaguchi Univ., JAPAN  
C. Caloz, École Polytechnique de Montréal, CANADA

**FR1A-1**  
Extended Composite Right/Left-Handed (E-CRLH) Metamaterial and Its Application as Quadband Quarter-Wavelength Transmission Line  

**FR1A-2**  
Group Delay Compensation Technique for UWB MMIC Using Composite Right/Left-Handed Circuit  
K. Murase, R. Ishikawa, and K. Horio, The Univ. of Electro-Communications, JAPAN

**FR1A-3**  
A Single-Diode Frequency Doubler Using a Feed-Forward Technique  
P. Rajanarongk, A. Namahoot, and P. Akkaraekthalin, King Mongkut’s Institute of Technology North Bangkok, THAILAND

**FR1A-4**  
Use of Quad-Phase Surface Acoustic Wave Filters as Power Combiner/Divider for RF Power Amplifiers  

**FR1A-5**  
An Ultra-Low-Loss Micromachined RF Monolithic Transformer with Partial Ground Shields (PPGS) for UWB RFIC Applications  

### Room B (302)
#### Session FR1B
**Miniature Planar and Integrated Filters (1)**  
*Chairs*: Z. Ma, Saitama Univ., JAPAN  
C. Phongcharoenspanich, King Mongkut Institute of Technology Ladkrabang, THAILAND

**FR1B-1**  
Miniaturized Microstrip Interlocked-Coupled Bandpass Filters Using Folded Quarter-Wavelength Resonators  
S.-C. Lin, Y.-S. Lin, and C. H. Chen, National Taiwan Univ., TAIWAN

**FR1B-2**  
Compact Bandpass Filters Based on Microstrip and Coplanar Waveguide Resonators  
T.-N. Kuo, S.-C. Lin, C.-H. Wang, and C.-H. Chen, National Taiwan Univ., TAIWAN

**FR1B-3**  
A Novel Compact Microstrip Bandstop Filter Based on Complementary Split-Ring Resonators  
J.-H. Lee, Y.-C. Oh, and N.-H. Myung, KAIST, KOREA

**FR1B-4**  
A Miniaturized Microstrip Common Resonator Triplexer without Extra Matching Network  
C.-F. Chen, T.-Y. Huang, T.-M. Shen, and R.-B. Wu, National Taiwan Univ., TAIWAN

**FR1B-5**  
A Compact Multilayered Balanced Filter Using Resonators Based on Interdigitally-Coupled Lines  
T. Fukunaga and K. Wada*, TDK Corp., *The Univ. of Electro-Communications, JAPAN

### Room C (303)
#### Session FR1C
**Material Measurements**  
*Chairs*: S. Kurokawa, AIST, JAPAN  
M. Jacob, James Cook Univ., AUSTRALIA

**FR1C-1**  
Study on Complex Permittivity of Materials With Temperature Change by Microwave Heating  

**FR1C-2**  
Temperature Dependence of Complex Permittivity of Planar Microwave Materials  
M. V. Jacob, J. Krupka*, J. Mazierska***, and M. Bialkowski****, **James Cook Univ., AUSTRALIA. ***Politechniki Warszawskie, POŁAND. ****Warszawski Univ., NEW ZEALAND. **Univ. of Queensland, AUSTRALIA

**FR1C-3**  
Evaluation of Complex Permittivity of Materials Partially Filled in Coaxial Line by Using Hybrid Numerical Method  
H. Yoshitake, H. Miyagawa, T. Nishikawa, K. Wakino, and T. Kitazawa, Ritsumeikan Univ., JAPAN

**FR1C-4**  
A Short-Circuit Transmission Line Method for PIM Evaluation of Metallic Materials  
Y. Yamamoto and N. Kuga, Yokohama National Univ., JAPAN

**FR1C-5**  
Measurement Accuracy of a TM₀₅ Mode Cavity Method To Measure Complex Permittivity of Rod Samples  

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**Friday, December 15**  
10:50 a.m. – 12:30 p.m.

### Room A (301)
#### Session FR2A
**RF-MEMS and Device Modeling**  
*Chairs*: T. Nishino, Mitsubishi Electric Corp., JAPAN  
K. Wu, École Polytechnique de Montréal, CANADA

**FR2A-1**  
Design of H-Mode Shaped Low Actuation-Voltage RF-MEMS Switches  
A. Batmang, E. K. I. Hamad, E. P. Burte, and A. S. Omar, Univ. of Magdeburg, GERMANY

**FR2A-2**  
Top vs. Bottom Charging of the Dielectric in RF MEMS Capacitive Switches  

**FR2A-3**  
Scalable Nonlinear Resistor Model for GaAs MMIC  
Y. Zhu, C. Wei, O. Klimashov, C. Zhang, and Y. Tkachenko, Skyworks Solution Inc., U.S.A.

**FR2A-4**  
An Inductor with Tapered Metals on Silicon Chip  
S.-Y. Lee, VIA Technologies, Inc., TAIWAN

**FR2A-5**  
Barium Strontium Titanate Thin Film Varactors on R-Plane Sapphire  

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### Room B (302)
#### Session FR2B
**Miniature Planar and Integrated Filters (2)**  
*Chairs*: J.-P. Hsu, Kanagawa Univ., JAPAN  
T. Ishizaki, Panasonic Electronic Devices Co., Ltd., JAPAN

**FR2B-1**  
The Microstrip Filter With Multiple Stacked Capacitively-Loaded Coupled Lines  

**FR2B-2**  
A Compact Bandpass Filter Design Using Cascaded CPW/Slotline Ring Resonators with Tapered Step Impedance CPW Fed Structure  
C.-F. Tai, I.-C. Chen, and H.-K. Chiu, National Central Univ., TAIWAN

**FR2B-3**  
A Design of Vertical Coupled Stacked Bandpass Filter Using Multilayer Structure without Via  
W.-J. Guan and L.A. Carpenter, Penn State Univ., U.S.A.

**FR2B-4**  
94 GHz CPW Branch-Line Bandpass Filter for Planar Integrated Millimeter-Wave Circuits  

**FR2B-5**  
Miniaturized Dual-Mode Quasi-Elliptic Function Bandpass Filter with Wide Rejection Bandwidth  
Y.-Z. Wang, C.-A. Wang, and K.-Y. Lin, Nan Kai Institute of Technology, TAIWAN

### Room C (303)
#### Session FR2C
**New Measurement Methods**  
*Chairs*: I. Iida, Fujitsu Ltd., JAPAN  
N. Cherpak, National Academy of Sciences of Ukraine, UKRAINE

**FR2C-1**  
Millimeter Wave Measurements of Complex Permittivity of Lossy Liquids Based on Whispering Gallery Dielectric Resonator Method  
N. T. Chepuk, A. A. Baramik, Y. V. Protsenko, A. Y. Kruchin, E. N. Shifrin, and I. A. Shupleva, National Academy of Sciences of Ukraine, UKRAINE

**FR2C-2**  
A Method for Evaluating a Complex Permittivity of Dielectric Material by Using Whispering Gallery modes on a Spherical Resonator  
M. Matsubara, Y. Kogumi, and Y. Tomabechi, Utanomya Univ., JAPAN

**FR2C-3**  
High Frequency Characteristics of Cu/Ta/Hydrogen Silsesquioxane (HSQ) System and the Effects of NH₃ Plasma Treatment on the Electrical Properties for Hydrogen Silsesquioxane  
C.-C. Ho and B.-S. Chiou, National Chiao Tung Univ., TAIWAN

**FR2C-4**  
Multipoint Scattering Matrix Measurement with a Two-port Network Analyzer Using Only Virtual Auxiliary Terminals  
C.-J. Chen and T.-H. Chu, National Taiwan Univ., TAIWAN

**FR2C-5**  
10,000 Parallel Heterodyne System for Instantaneous Photonics-Based Acquisition of Near-Fields Images over Microwave Devices/Circuits  
K. Sasagawa, T. Kawanishi, and M. Tsujiuchi, NICT, JAPAN
### TECHNICAL SESSION

#### Session FR3D (304)
**Multiband Antennas**
*Chairs*: T. Teshirogi, Anritsu Corp., JAPAN
W. Hong, Southeast Univ., CHINA

**FR3D-1**
A Printed Triple-Band Antenna for WiFi and WiMAX Applications
Y.-C. Shen, Y.-S. Wang, and S.-J. Chung, National Chiao Tung Univ., TAIWAN

**FR3D-2**
A Design of Miniaturized Built-in Penta Band Chip Antenna For EGSM/GPS/DCS-1800/USPCS/WCDMA Mobile Handset

**FR3D-3**
The Performance of Dual-Band CPW-Fed Printed Antennas for Wireless Body-Worn Applications
X. Qiu and A. S. Mohan, Univ. of Technology, Sydney, AUSTRALIA

**FR3D-4**
Compact Multi-Band Antenn for Mobile Telephone Applications
S.-Y. Heung and J.-S. Sun, National Taipei Univ. of Technology, TAIWAN

**FR3D-5**
Dual-Band Printed T-Shaped Slot Antenna for WLAN Application
S.-S. Zhong and X.-L. Liang, Shanghai Univ., CHINA

### Session FR4D (304)
**Propagation**
*Chairs*: T. Fuji, Japan Telecom., JAPAN
S. Takahashi, Hiroshima City Univ., JAPAN

**FR4D-1**
Measurements on UHF Radio Propagation over the Seto Inland Sea
M. Nishi, T. Iwami, S. Takahashi, and T. Yoshida, Hiroshima City Univ., JAPAN

**FR4D-2**
Millimeter Wave Propagation in a Short Outdoor Link Using the Vectorial Gaussian Beam Tracking Method
M. Shabani and A. A. Shishegar, Sharif Univ. of Technology, IRAN

**FR4D-3**
Proposal of Novel Statistic Channel Model for Millimeter-Wave WPAN
H. Sawada, Y. Shoji, and C.-S. Choi, NICT, JAPAN

**FR4D-4**
A New Computational Parallel Model Applied in 3D Ray-Tracing Techniques for Radio-Propagation Prediction
A. Cavalcante, M. Sousa, J. Cristiostomo, C. Frances, and G. Cavalcante, Federal Univ. of Pará, BRAZIL

**FR4D-5 (INVITED)**
MIMO Multidimensional Propagation Channel Modeling
Y. Karasawa, The Univ. of Electro-Communications, JAPAN

#### Session FR3E (311+312)
**Advanced Technologies for Power Amplifiers**
*Chairs*: Y. Takayama, Univ. of Hyogo, JAPAN
T.-W. Huang, National Taiwan Univ., TAIWAN

**FR3E-1**
Improvement of Intermodulation Distortion in Microwave Power Amplifiers with Intrinsic Second-Harmonic Short-Circuit Termination
K. Watanabe, Y. Takayama, K. Yamaguchi, T. Fujita, and K. Maenaka, Univ. of Hyogo, JAPAN

**FR3E-2**
Compact Device-Level Linearisation Technique Using a Reduced Complexity Derivative Superposition Approach
R. Nega**, F. M. Ghannouchi**, and W. Rachtold*, *ETH Zurich, SWITZERLAND, **Univ. of Calgary, CANADA

**FR3E-3**
Minimum ACPR “Sweet-Spot” Using Statistical Power Distribution Function
J.-H. Tsai, S.-Y. Chen, W.-C. Chen, and T.-W. Huang, National Taiwan Univ., TAIWAN

**FR3E-4**
InGaP/GaAs HBT Power Amplifier Based on Flexible Printed Circuit Board

**FR3E-5**
Third-Order Intermodulation Distortion Characteristics of Millimeter-Wave Self-Heterodyne Transmission Techniques
C.-S. Choi and Y. Shoji, NICT, JAPAN

#### Session FR4E (311+312)
**Power Amplifiers for Mobile Communication**
*Chairs*: K. Mori, Mitsubishi Electric Corp., JAPAN
B. Kim, Pohang Univ. of Science and Technology, KOREA

**FR4E-1**
Surface-Mount Power Amplifier Module for WiMAX Application
N. Yoshimura, K. Matsuzaki, T. Hashinaga, and S. Nakajima, Eaidyn Devices Inc., JAPAN

**FR4E-2**
GaN HBT Power Amplifier for WiBro Applications
P. Li, H. Fuh, L. Prestia, C. Huber, S. Kadambala, C. Masse, D. Wilson, and E. Balboni, Analog Devices Inc., U.S.A.

**FR4E-3**
Reduced Gain Variation against Temperature with Thermostat on HPA Module for W-CDMA System

**FR4E-4**
A Doherty Power Amplifier Module for Mobile Terminals with Variable Linearity Function
T. Kato, K. Yamaguchi, and Y. Kuriyama, Toshiba Corp., JAPAN

**FR4E-5 (INVITED)**
Doherty Linear Power Amplifiers for Mobile Handset Applications
B. Kim, J. Nam, and D. Yu, Pohang Univ. of Science and Technology, KOREA

#### Session FR3F (313+314)
**Ferrite and SAW Devices**
*Chairs*: M. Tsutsuki, Fakui Univ. of Technology, JAPAN
A. Alphones, Nanyang Technological Univ., SINGAPORE

**FR3F-1**
Micromached GaN-Based FBR Structures for Microwave Applications

**FR3F-2**
Prediction of Phase Noise in 2.4GHz SAW Oscillator with Surface Transverse Wave Resonator
J.-H. Lin and Y.-H. Kao, National Chiao-Tung Univ., TAIWAN

**FR3F-3**
Some Nonlinear Properties on the Electromagnetic Waves in Magnetic Material
K. Kawabe, T. Koder*, and Y. Satomura, Osaka Institute of Technology, *ATR, JAPAN

**FR3F-4**
Effect of Nonuniform Magnetic Field on Left Handed Ferrite Microstrip Line
K. Okubo and M. Tsutumi*, Okayama Prefectural Univ., *Fakui Univ. of Technology, JAPAN

**FR3F-5**
Tunable, Stepped Impedance Resonator Bandpass Filter Using Ferroelectric Materials

#### Session FR4F (313+314)
**Waveguide Circuits**
*Chairs*: T. Yakabe, The Univ. of Electro-Communications, JAPAN
C.-H. Chen, National Taiwan Univ., TAIWAN

**FR4F-1 (INVITED)**
Substrate Integrated Circuits for Radio-Frequency and Millimeter-Wave System Applications-Status and Outlook
K. Wu, Ecole Polytechnique (Univ. of Montreal), CANADA

**FR4F-2**
Design of Substrate Integrated Waveguide Sum-Difference Comparator
Y. Tang and W. Wu, Nanjing Univ. of Science and Technology, CHINA

**FR4F-3**
Low-Loss LIGA-Fabricated Coplanar Waveguide and Filters
M. A. Forman, Sandia National Laboratories, U.S.A.

**FR4F-4**
A Broadband, Low-Reflection H-Plane Waveguide Corner with a Dielectric Circular Post
K. Toda, I. Ohta, and M. Kishihara*, K. Toda, I. Ohta, and M. Kishihara*, *Fukui Univ. of Technology, JAPAN

**FR4F-5**
Analysis of Quadruple-Ridged Square Waveguide by Multilayer Perceptron Neural Network Model
Y. Tang and W. Wu, Nanjing Univ. of Science and Technology, CHINA
Session WEOF

WEOF-01 Comparison of CMOS LNAs Implemented with Different Capacitor and Inductor Structures
M. T. A. Gusal and L. P. Alarcon, Univ. of the Philippines, PHILIPPINES

WEOF-02 A 1V, 0.9dB Noise-Figure High Linearity LNA MMC for Concurrent GPS Handset Application

WEOF-03 1.5V 5 GHz Low Noise Amplifier With Source Degeneration
M.-T. Hu, T.-Y. Chih, and G.-R. Li, National Yunlin Univ. of Science and Technology, TAIWAN

WEOF-04 The Design of Full-Band (3.1–10.6GHz) CMOS UWB Low Noise Amplifier with Thermal Noise Canceling

WEOF-05 Dual-Band LNA for 2.4/5.2GHz Applications
V. K. Diao, B. G. Choi, Q. D. Bui, and C. S. Park, ICU, KOREA

WEOF-06 A CMOS Ultra-Wideband Differential Low Noise Amplifier

WEOF-07 Numerical Analysis of Pulsed I-V Curves and Current Compression in GaN FETs
K. Itagaki, H. Takayanagi, H. Nakano, and K. Hori, Shibaura Institute of Technology, KOREA

WEOF-08 Closed-Form Expression of IMD Considering Input/Output Frequency Responses in Nonlinear RF Power Amplifiers for Digital Predistortion
H. Ku, Konkuk Univ., KOREA

WEOF-09 Quasi-Invariant Single-Parameter Criterion for Unconditional Stability: Review and Application
E. L. Tan, Nanyang Technological Univ., SINGAPORE

WEOF-10 Numerical Investigation on Thermal Characteristics of GaN HFETs for High Power Applications
J. Xu, W.-Y. Yin, and J. Mao, Shanghai Jiao Tong Univ. CHINA

WEOF-11 Harmonic Orthogonality Condition in RF Class-E Power Amplifiers
M. A. Yarleque Medina, D. Schreurs, and B. Nauwelaers, Katholieke Universiteit Leuven, BELGIUM

WEOF-12 An Accurate Technique for Characterizing Non-Linear Currents in MESFET/HEMT Devices
S. L. Henriquez, A. J. Oginniyi, C. Karangu, D. Harvey, and C. White, Morgan State Univ., U.S.A.

WEOF-13 Single-Stage, High Efficiency, 26-Watt Power Amplifier Using SiC LE-MESFET

WEOF-14 The Suppression of Intermodulation Products in Multichannel Amplifiers Close to Saturation
N. Maleš-Ilić and B. Milovanović, Univ. of Nis, SERBIA

WEOF-15 Volterra Series Approach to Behavioral Modeling: Application to an FET Amplifier
C. Crespo-Cadenas, J. Reina-Tosina, and M. J. Madreno-Ayora, Univ. de Sevilla, SPAIN

WEOF-16 Investigation into RF Feedback for Improving The Efficiency-Linearity Trade-off in Power Amplifiers
Y. J. Tian and D. G. Haigh, Imperial College London, U.K.

WEOF-17 A High Power Performance 60 GHz Push-Push Oscillator MMIC in Metamorphic HEMT Technology

WEOF-18 Accurately Measure Phase-Locked Loop (PLL) Lock Time in Production
L. Zhang, Texas Instruments, Inc., U.S.A.

WEOF-19 Intermodulation Nulling in Anti-Parallel Diode Pair Mixers
V. Gotta, T. Fattorini*, and A. Parker, Macquarie Univ., *Microm Broadband, AUSTRALIA

WEOF-20 A Simple Oscillator Design with the Frequency Controlled by Patch Size

WEOF-21 Wide BST-Based Tuning of Voltage Controlled Oscillator
M. Al-Almad, C. Loyez, N. Rolland, and P.-A. Rolland, IEMN, FRANCE

WEOF-22 Residual and Oscillator Phase Noise in GaAs HEMT's
M. Fen Dahl* and H. Zirath**, **Chalmers Univ., **Ericsson AB, SWEDEN

WEOF-23 Switchless Bi-Directional Amplifier
C. S. Yu, K. T. Mok, and W. S. Chan, City Univ. of Hong Kong, CHINA

WEOF-24 On the Improvement of the Linear Dynamic Range of Ka-Band Up-Converters
E. Bertran, J. Berenguer, G. Montoro, and A. Cidronali*, Technical Univ. of Catalonia, SPAIN, *Univ. of Firenze, ITALY

WEOF-25 Five-Port Software Defined Radio Receiver Implementation in Ka-Band
R. Mirzavand, A. Mohammad, and A. Abdipour, Amirkabir Univ., IRAN

WEOF-26 Sub Milli-Watt, 2.4GHz, Super-Regenerative Transceiver with Ultra Low Duty Cycle
I. McGregor, E. Wasseg, and I. Thayne, Glasgow Univ., U.K.

WEOF-27 A High Linear Upconversion Mixer and VCO Design Using Fully Integrated Current Injection Technique
M.-J. Kim and N.-Y. Kim, Kwangwoon Univ., KOREA

WEOF-28 A Novel Approach for Implementation of a Matrix Amplifier
G. Moradi and A. Abdipour, Amirkabir Univ. of Technology, IRAN

WEOF-29 Design of Cartesian Feedback Loop Linearization Chip for UHF Band
M.-S. Kang, Y.-J. Chong, S.-J. You, and T.-J. Chung, ETRI, KOREA

WEOF-30 A Low Power 0.18um CMOS Even-Harmonic Mixer

WEOF-31 Differential Power Combining Technique for General Power Amplifiers Using Lumped Component Network

WEOF-32 0.25 μm CMOS Resistive Ring Subthreshold Mixer
P. Wang, M. Chen, and O. Boric-Labecke, Univ. of Hawai'i at Manoa, U.S.A.

WEOF-33 A New Implementation for RF SiCMOS Transistor Model Using SDD for Quantifying Individual Contribution to Distortion from Transistor's Nonlinear Parameters
A. Abuelmaatti, I. Thayne, I. McGregor, and E. Wasseg, Univ. of Glasgow, U.K.

WEOF-34 A Reconfigurable CMOS Power Amplifier with Flexible Matching Network
S.-O. Yun and H.-J. Yoo, ICU, KOREA

WEOF-35 High Susceptibility of Micro-Phonic and Phase-Hit Dual Loop Push-Push Synthesizer Design for High Modulation Microwave Digital Radios
Y. Shen, L. Villeneuve, and N. Hassane, Harris Corp., U.S.A.

WEOF-36 13 GHz Cascaded 1:4 CMOS Injection Locked Frequency Divider

WEOF-37 Experimental Evaluation of Service Area in Wireless Service Over IP Systems
Y. Fujisawa, T. Higashino, K. Tsukamoto, and S. Komaki, Dalian Maritime Univ., CHINA

WEOF-38 SSR-MAC: A Novel MAC Protocol for Mobile Ad Hoc Network
F. Jun, L. Zhiting, and W. Li, Huazhong Univ of Sci & Tech, CHINA

WEOF-39 The Remote HF-Doppler Detection of the Sunrise Effect
Y. Zhang and Y. Wang, Dalian Maritime Univ., CHINA
OPEN FORUM

2:30 p.m. – 4:00 p.m. Thursday, December 14

Lounge

Session THOF

THOF-01 DGS Based SIR Filters for Wireless Communication on Anisotropic Substrate
S. Singh and B. Rawat, Univ. of Nevada, U.S.A.

THOF-02 Circuit Direct Replacement Method Enhanced Skirt Response of Open Stub Low-Pass Filter
J.-D. Tseng and W.-T. Liu, Chin Yi Institute of Technology, TAIWAN

THOF-03 Design of a Vertically Stacked Waveguide Filter with Novel Cross Coupling Structures in LTCC
T.-M. Shen, T.-Y. Hung, C.-F. Chen, and R.-B. Wu, National Taiwan Univ., TAIWAN

THOF-04 A Bandpass Filter with Cross-Coupled L-Shaped Folded Resonators for Compact Size and Spurious Suppression
P. Akkaratbhalin, S. Hongdamnu, and V. Vivek, King Mongkut’s Institute of Technology North Bangkok, THAILAND

THOF-05 A Novel Microstrip Dual-Band Bandstop Filter with Controllable Dual-Stopband Response

THOF-06 A Hybrid Synthesis Technique for N-tuple Microwave Filters Cascaded by Resonator
W. Meng and K.-L. Wu, the Chinese Univ. of Hong Kong, CHINA

THOF-07 Novel Microstrip Dual-Band Bandstop Filter with Controllable Dual-Stopband Response

THOF-08 A Novel Suspended Substrate Bandpass Filter Using H-Shaped Resonator

THOF-09 A Method of Synthesis of Cross-Coupled Bandpass Resonator Filters by Using Genetic Algorithms
Y. Hsu and Z.-H. Feng, Tsinghua Univ., CHINA

THOF-10 Vibration Modal Analysis Used Finite Element Method of Microwave Amplitude Equalizer

THOF-11 Reduced-Sized Single Coupled-Line Low Pass Filter
J.-D. Tseng and P.-S. Chen, Chin Yi Institute of Technology, TAIWAN

THOF-12 A Semicircle DGS With High Q Factor for Microstrip Line and Low-Pass Filter
S. Lin***, W. Tian***, S. Zheng**, and X. Sun*, *Shanghai Institute of Micro-system & Information Technology, **Chinese Academy of Science, CHINA

THOF-13 Dielectric Loaded Cavity Filter with Wide Spurious Free Region and Better Out-of-Band Rejection
X.-G. Sun, Transcend Communication Co., CHINA

WEOF-00 Markov Characterization of Channels and its Applications in Powerline Communications Systems
M. Zhai, North China Electric Power Univ., CHINA

WEOF-01 A Novel Simulation Testbed for Space-Time Signal Processor of Smart Antenna System Based on HILS Technology
W. Liu, Q. Zhang, and Z. Feng, Tsinghua Univ., CHINA

WEOF-02 The New Approach to Microwave RFID
I. B. Shirvok and Y. B. Gimpilevich, Sevastopol National Technical Univ., UKRAINE

WEOF-03 Detection of Dielectric Contrast of Breast Tissues Using Confocal Microwave Technique
G. Bindu, C. K. Aanandan*, K. T. Mathew*, and S. J. Abraham**, Manipal Institute of Technology, *Cochin Univ. of Science and Technology, **Kosciel Hospital, INDIA

WEOF-04 EM Field Coupling to Coplanar Transmission Lines
H. Khodabakhshi, A. Cheldavi, and M. Khalaj-Amirhosseini, Iran Univ. of Science and Technology, IRAN

WEOF-05 Enhanced Linear Dynamic Range of Electroactive Modulators Based on Birefringent Gires -Tournois Interferometer
J. E. B. Oliveira and B. F. R. Sakamoto, Instituto Tecnolóxico de Aeronáutica ITA - Brazilian Air Force, BRAZIL

WEOF-06 Measurements of Conductivity of Thin Gold Films at Microwave Frequencies Employing Resonant Techniques
T. Zychowicz, J. Krupka, and J. Mazierska*, Warszaw Univ. of Technology, POLAND, *Massey Univ., NEW ZEALAND

WEOF-07 A Proposal for High-Precision Fiber Optic Displacement Sensor
M. Noshad, H. Hedayati, and A. Rostami, Univ. of Tabriz, IRAN

WEOF-08 Observations of Cloud Properties Using the Millimeter-Wave WEOF-52
X. Zhang, W. Zhang, X. Lu, G. Kang, and G. Fang, Tsinghua Univ., CHINA

WEOF-09 An Analysis of Coupled Anisotropic Optical Waveguides
M. A. Boroujeni and M. Shahabadi, Univ. of Tehran, IRAN

WEOF-10 FIR Cavity for Terahertz Laser
A. Dubey and H. Dave, Physical Research Laboratory, INDIA

WEOF-11 A Measurement System for Space-Time Variation of Rainfall Rate and Millimeter-Wave Specific Attenuation in Indonesia
Y. Hsu and Z.-H. Feng, Tsinghua Univ., CHINA

WEOF-12 A Method of Synthesis of Cross-Coupled Bandpass Resonator Filters by Using Genetic Algorithms
Y. Hsu and Z.-H. Feng, Tsinghua Univ., CHINA

WEOF-13 Microwave Moisture at Depth

WEOF-14 Dielectric Loaded Cavity Filter with Wide Spurious Free Region and Better Out-of-Band Rejection
X.-G. Sun, Transcend Communication Co., CHINA

WEOF-15 A Radar for Range-Finding of Multiple Targets Based on Microwave Measurement of Biological and Allied Materials
D. Faktorová, K. K. Grondz, and K. Grondz, Instituto Tecnológico de Zilina, SLOVAK

WEOF-16 Electric and Magnetic Shielding Effectiveness of Metallic Enclosures with Apertures
M. Z. M. Jenu and F. A. Po’rad, Kolej Universiti Teknologi Tun Hussein Onn, MALAYSIA

WEOF-17 Microwave Measurement of Biological and Allied Materials
D. Faktorová and K. Grondz, Univ. of Zilina, SLOVAK

WEOF-18 Effect of Metallic Helmet on the Microwave Absorption in a Spherical Phantom of a Dipole Antenna User Head
V. V. Radchenko and A. I. Nosich, NASU, UKRAINE

WEOF-19 Analytic Solutions of Ground Bounces in PCBs Using Perfect Magnetic Wall Approximations
C.-C. Huang, Yuan Ze Univ., TAIWAN

WEOF-20 A Radar for Range-Finding of Multiple Targets Based on a Simplified FMWC Method
T. Uebo and Y. Okubo, Saika Technological Institute Foundation, JAPAN

WEOF-21 Dual-Frequency SAR for the Measurement of Soil Moisture at Depth
X. Zhang, W. Zhang, X. Lu, G. Kang, and G. Fang, Chinese Academy of Sciences, CHINA

WEOF-22 Observations of Cloud Properties Using the Millimeter-Wave FM-CW Radar of Chiba Univ

WEOF-23 Characterization of Dielectric Properties for PZN-PMN-PT Ferroelectric Thin Films at Microwave Frequencies

WEOF-24 A Measurement System for Space-Time Variation of Rainfall Rate and Millimeter-Wave Speciﬁc Attenuation in Indonesia
G. Hendrantoro, A. Mauludiyanto, and P. Handayani, Institut Teknologi Sepuluh Nopember, INDONESIA

WEOF-25 Obligately Cut Open Ended Coaxial Probe for Obtaining Complex Permittivity of Lossy Materials
T. Michiyama, E. Tanabe*, and Y. Nikawa, Kokushikan Univ., *AET, Inc., JAPAN

WEOF-26 New Technique for Analysing Coplanar Lines on Ceramic Up to 110 GHz
C. Min and C. E. Free, Univ. of Surrey, U.K.

WEOF-27 Measurements of Complex Permittivity and Permeability With Changing An Angle of Incidence of Parallel Beam generated by Dielectric Lenses
H. Suzuki, T. Horchi, and M. Inoue, KEYCOM Corp., JAPAN
THOF-14 A Novel Compact Defected Ground Structure (DGS) Low Pass Filter
A. Mohan and A. Biswas, Indian Institute of Technology, INDIA

THOF-15 Sharp-Rejection, Compact Wide-Band Bandpass Filters
M. K. Mandal and S. Sanyal, Indian Institute of Technology, INDIA

THOF-16 Equalizing of Group Delay for Feed Forward Amplifier Using Dielectric Filters
J. Hayashi and Y. Nikawa*, Soshin Electric Co., Ltd., *Kokushikan Univ., JAPAN

THOF-17 Low Loss Planar Dielectric Waveguide Filter with Cross Coupling Using LTCC Technology at 60GHz Band
D.-S. Jun, H.-C. Kim, and H.-K. Yu, ETFI KOREA

THOF-18 Ultra-Wideband (UWB) Bandpass Filters Using Hybrid Microstrip/CPW Structures
H. Wang, L. Zhu, W. Meen*, and Z. N. Chen**, Nanogradiant Technology Lab., SINGAPORE, *Univ. of ULM, GERMANY, **Institute for Infocom Research, SINGAPORE

THOF-19 The Microstrip Bandpass Filters With Wide Outband Suppression

THOF-20 The Multilayered Triplexer with Low Insertion Loss

THOF-21 Compact Microstrip Diplexers Based on a Dual-Passband Filter
P.-H. Deng, C.-H. Wang, and C.-H. Chen, National Taiwan Univ., TAIWAN

THOF-22 Design of a Novel Microstrip Bandstop Filter Using One Compact C-Open-Loop Resonator

THOF-23 A Microstrip Bandpass Filter Using a Line Periodically Loaded with Unbalanced SIRs for Size Reduction and Spurious Suppression
T. Mujaeng, S. Chaisnos, J. Jantace, and P. Akekarattikhun, King Mongkut's Institute of Technology North Bangkok, THAILAND

THOF-24 Design of Microstrip Dual-Band Filters Using Double-Diplexing Configuration
C.-L. Hou and J.-T. Kuo, National Chiao Tung Univ., TAIWAN

THOF-25 Simulation of Resonant Frequencies of the Metal Cavity by the Unconditionally Stable 3D Crank-Nicolson FDTD Method
Y. Yang and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

THOF-26 An Ultrawide Bandpass Filter Using Ceramic Multilayer Construction
C.-S. Yoo, J.-K. Lee, D. Kim, H.-C. Jung, N.-K. Kang, K.-S. Seo, and W.-S. Lee, Korea Electronics Technology Institute, KOREA

THOF-27 A Class of UWB Microstrip Bandpass Filter Using Quasi-Lumped Element Resonators with Controllable Stopbands
T. Ohno, Y. Ohno, K. Wada*, and O. Hashimoto, Aoyama Gakuin Univ., *The Univ. of Electro-Communications, JAPAN

THOF-28 Improved High-Q Microwave Dielectric Resonator Using B2O3 Doped Nd(Co2Ti2)3O7 Ceramics
C.-F. Tseng and C.-L. Huang, National Cheng Kung Univ., TAIWAN

THOF-29 Group Delay Analysis of Differential-Mode Coupled Four Lines Bandpass Filters

THOF-30 Coupled-Line Sharp Notch Filter with Significant Improvement of Attenuation
H. Ishida and K. Araki*, NICT, *Tokyo Institute of Technology, JAPAN

THOF-31 Microwave Characterization of High-Tc Superconducting Microstrip Line Using FDTD Technique
H. Ghamalouche, M. Benkraouda, M. Hussein, and T. Badameh, United Arab Emirates Univ., U.A.E.

THOF-32 A New Compact Capacitive-Gap-Coupled Microstrip Bandpass Filter Using Arrowhead Shape as Defected Ground Structure (DGS)
A. Boutjdar, A. Eshelbier*, and S. A. Omar, Univ. of Magdeburg, GERMANY, *Ain Shams Univ., EGYPT

THOF-33 A New Mathematical Design Method of Microstrip Tapped-Line Filters
I.-W. Lee, S.-H. Han, T.-S. Yun, K.-C. Yoon, Z. Fang, and I.-C. Lee, Kwangwoon Univ., KOREA

THOF-34 A Tunable Bandpass Filter Using Tapped λ/4 Resonators Loaded with Inductive Variable Capacitor
T. Ohno, K. Omatu, K. Wada*, and O. Hashimoto, Aoyama Gakuin Univ., *The Univ. of Electro-Communications, JAPAN

THOF-35 High-Temperature Superconducting Reaction-Type Transmitting Filter Consisting of Novel Split Open-Ring Resonators
S. Futasuromori, T. Higake, and T. Nojima, Hokkaido Univ., JAPAN

THOF-36 Evaluation of Loss and AHPIC of DC-Biased Low K Transmission Line in MMICs Technologies

THOF-37 Efficient Evaluation of a 2-Feed Method to Reduce Fields along the Edge of the PowerGround Planes
S. Kahng, Univ. of Incheon, KOREA

THOF-38 A Novel Planar Structure of Double Negative Material
Z. Zhang and S. Xu, Univ. of Science and Technology of China, CHINA

THOF-39 Standing Waves in a Coaxial Cavity Gyrotrode with a Corrugated Insert
O. Komenyko and Y. Gandel, Kharkov National Univ., UKRAINE

THOF-40 A Microwave Modeling of Multilayered Chip Inductors

THOF-41 Tunable Optical Delay Line Using Two Port Ring Resonator
G. Rostami*, A. Rostami*, H. Akhavan**, and A. Zarrink*, **Univ. of Tabriz, TURKEY

THOF-42 Identification of Complex Bragg Fraingins (Apodized and Chaped) Using Artificial Neural Networks (ANN)
A. Rostami and A. Yazdanpanah-Goharzini, Univ. of Tabriz, IRAN

THOF-43 Design of High Power Phase Shifter with Left-Handed Transmission Line
S.-Y. Wang, Q. Zhu, and I.-F. Zhu, Univ. of Science and Technology of China, CHINA

THOF-44 An Left Handed Material on Si CMOS Chip with Wafer Level Package Process

THOF-45 A Single Matching Network Design for a Double Band PIFA Antenna Via Simplified Real Frequency Technique

THOF-46 Highly Miniaturized On-Chip Impedance Transformers Employing PPGM with Single-Sided Via Holes for Application to GaAs MMIC
Y. Yun, C.-R. Kim, and K.-S. Lee, Korea Maritime Univ., KOREA

THOF-47 RF Passives on a 0.25μm Digital CMOS Process
J. Hzon, M. Rosales, H. Tan*, L. Alarcon, and D. Sabido**, Univ. of the Philippines, *Inter Manufacturing Philippines, **Eaxix Inc., PHILIPPINES

THOF-48 Power Control in Passive Waveguide Circuits
J. Zebenmiller, J. Machac, and P. Zablonidil, Czech Technical Univ., CZECH REPUBLIC

THOF-49 A Novel Type of Wideband Self-Adapting Coplanar Feeding Network
W. Chai and X. Zhang, Chinese Academy of Sciences, CHINA

THOF-50 Coupled Mode Theory Approximation for Arbitary Conventional/Metamaterial Contradirectional Coupled-Line Couplers
H. V. Nguyen and C. Caloz, École Polytechnique de Montréal, CANADA

THOF-51 Compact CPW Rat Race and Branch-Line Hybrids Utilizing Slow-Wave Structure
T. Fujiy, Y. Kobata, and J. ObTa, Univ. of Hyogo, JAPAN

THOF-52 A New Type of Multi-Way Microwave Power Divider Based on Bagley Polygon Power Divider
I. Sakagami, T. Wuren, M. Fujii, and Y. Tomoda, Toyama Univ., JAPAN
THOF-01 Estimation of Rain Induced Attenuation at 10–300 GHz over Earth-Space Path Links Over Amritsar (India)

THOF-02 A New Microwave-Excited Plasma Source Using an Internal Dielectric Microwave Applicator
K. Shimatani, Y. Tsugami, and I. P. Ganachev, Shibaura Inst. Technology, JAPAN

THOF-03 Observation of VHF Broadcast Radio Waves Propagating From China
M. Yoneji, T. Takano, H. Nakata, and S. Shimakura, Kinki Univ., JAPAN

THOF-04 The Concept and Evaluation of GPS Skyward Visibility Archive for Future-Oriented Vehicular Satellite Communications
M. Takahashi, Univ. of Tokyo, NICT, JAPAN

THOF-05 Coupled Computational Intelligence and Time-Domain Method for Design of the Microwave Devices

THOF-06 Edge-Based Vector FEM for Electromagnetic Wave Tool
A. Chen, A. Chen, and D. Su, Beijing Univ., CHINA

THOF-07 A Novel High Order MoM/PO Hybrid Method for 3D EM Scattering Problems
S. Liu and X. Zhang, Chinese Academy of Science, CHINA

THOF-08 Macro Element Methods in FEM for 3-D Electromagnetic Radiation Problems
N. Feng, D. Shuo, Z. Lezhu, and X. Mingyao, Peking Univ., CHINA

THOF-09 Efficient Design Approach of MW-Class RF-Dc Conversion Rectenna Circuits by FDTD Analysis
T. Takagaki, T. Yamamoto, K. Fujimori, M. Sanagi, and S. Nogi, Okayama Univ., JAPAN

THOF-10 Microwave Absorption Studies of the Granular Magnetic Plate
A. V. Babushkin, I. V. Bychkov*, and V. D. Buchel, Federal State Unitary Enterprise, *Chelyabinsk State Univ., RUSSIA

THOF-11 An efficient Modified Interpolation Technique for the Translation Operators in MLFMM with Curvilinear RWG Basis
D. Z. Ding, R. S. Chen, C. Wang, and Q. L. Zhang, Nanjing Univ. of Science and Technology, CHINA

THOF-12 Embedding of Short-Open Calibration Technique in Commercial MoM Simulators for Parameter Extraction of Planar Integrated Circuits
L. Hao*, K. Wu**, W. Hong*, LI**, and X. Chen*, *Southeast Univ., **Southeast Univ., CHINA. *École Polytechnique de Montréal, CANADA

THOF-13 An Enhancement of Input Impedance Bandwidth of Circular-Disc Loaded Monopole Antenna with Horizontal and Vertical Parasitic Strips

THOF-14 A P-Version Multigrid Method for Fast Hierarchical Vector Finite-Element Analysis of Waveguiding Structures
J. Zhu and R. S. Chen, Nanjing Univ. of Science and Technology, CHINA

THOF-15 On Dispersion in Different Position of Microstrip Line
P. Shi, X. Yin, and W. Hong, Southeast Univ., CHINA

THOF-16 Theoretical Analysis of Field Distribution and Radiation of Wider
Y. Yao and Z. Feng, Tsinghua Univ., CHINA

THOF-17 A Novel Band-Notched Ultra-Wideband Microstrip-Line Fed Wide-Slot Antenna
Y. Yao and Z. Feng, Tsinghua Univ., CHINA

THOF-18 Stacked Square Microstrip Antenna with a Shorting Post for Dual Band Operation in WLAN Applications
T. Fujimoto and K. Tanaka, Nagaoka Univ., JAPAN

THOF-19 Parasitically Loaded Broad Band Microstrip Antennas for Proposed IEEE 802.15.3a (UWB) Communication Systems
S. Chakraborty, U. K. Dey, S. Pandu, and B. Gupta, Jadavpur Univ., INDIA

THOF-20 A New Half-Loop Antenna for UWB Spectrum
Y.-C. Lee, C.-J. Wang, and J.-S. Sun, Taipei Univ. of Technology, TAIWAN

THOF-21 Unequal Cross Aperture Coupled Compact CP Antenna with Four Y-Shaped Slits and Four Normal Slits

THOF-22 Inverted Triangle Printed Monopole Antenna with Half-disk for UWB Applications
R. Chayono, M. Haneshi, and Y. Kimura, Saitama Univ., JAPAN

THOF-23 Spectral Domain Analysis of Resonant Characteristics of a Circular Patch Microstrip Antenna on Uniaxial Substrate
A. Motevasselian and A. Tavakoli, Amirkabir Univ. of Technology, IRAN

THOF-24 A Novel Wideband Patch Antenna for 2.4/5 GHz WLAN Applications
K. S. Yoon, S. M. Kim, and W. G. Yang, Univ. of Incheon, KOREA

THOF-25 A Wideband Rectangular Ring Antenna Fed by Planar Disc Monopole
S. Lamuliere**, C. Phongcharoenpanich**, S. Kosalvut**, M. Krairiksh**, *Amirkabir Univ., **King Mongkut’s Institute of Technology Ladkrabang, THAILAND

THOF-26 CPW-Fed Ultra Wideband (UWB) Monopoles with Band Rejection Characteristic on Ultra Thin Organic Substrate
FROF-27  On the Design of Fractal Elements for Miniaturized Antenna Applications  
G. S. A. Shaker and S. Safavi-Naeini, Univ. of Waterloo, CANADA

FROF-28  Dual-Band and Dual-Polarization Patch Antenna with High Isolation Characteristic  
D.-H. Choi and S.-O. Park, Information and Communications Univ., KOREA

FROF-29  Antenna in HSBGA Package for 2.4 GHz WLAN Application  
T.-H. Lu, S.-H. Yeh, and C.-L. Tang, Industrial Technology Research Institute, TAIWAN

FROF-30  Influence of Coupling and Diagram Correlation on MIMO Capacity Performances at 2 GHz  
S. Vergerio, J.-P. Rossi, and P. Sabouroux*, France Télécom R&D, *Institut Fresnel, FRANCE

FROF-31  A Wideband C-Shaped Vertical Patch Antenna  
K.-L. Lau, K.-M. Luk, and K.-F. Lee*, City Univ. of Hong Kong, CHINA, *The Univ. of Mississippi, U.S.A.

FROF-32  A Novel Planar Highly Shaped-Beam Antenna Using Leaky-Wave Characteristics  
R. B. Hwang, National Chiao Tung Univ., TAIWAN

FROF-33  Development of Low-Loss Millimeter-Wave Antennas on Fluorine Substrate Using Electro-Fine-Forming Fabrication  

FROF-34  Performance of Reflectarray Cells Printed on Liquid Crystal Film  

FROF-35  Three-Dimensional On-Chip Conical Spiral Antennas on Video-Monitor Micromachined (100) Silicon Wafers  
H. Sedaghat-Pisheh, S. Mohajerzadeh, and M. Shahabadi, Univ. of Tehran, IRAN

FROF-36  High Transmission Gain Slot Antennas on Silicon Substrate for Wireless Interconnect  
L. Jiang, J. Mao, and W.-Y. Yin, Shanghai Jiao Tong Univ., CHINA

FROF-37  A Dielectric-Position-Controlled Beam Adjustable Leaky-Wave Antenna  
C.-C. Hsiao and R. B. Hwang*, Ching Yun Univ., *National Chiao Tung Univ., TAIWAN

FROF-38  A Study of the Performance of a Small Radiator near a Miniaturized Artificial Magnetic Surface (AMC)  
G. S. A. Shaker and S. Safavi-Naeini, Univ. of Waterloo, CANADA

FROF-39  Study on COBRA Lens Horn for Miniaturization and Improvement of Pattern  

FROF-40  Radiation from an Antenna in Manhole  
S. Mizushima, A. Adachi, and T. Watanabe*, Engeene Co., Ltd., *Shizuoka Univ., JAPAN

FROF-41  Novel S-DMB Antenna Design Using Modified QHA  
G.-S. Chae, Y.-C. Park, J.-S. Lim, and M.-N. Kim, Baekseok Univ., KOREA

FROF-42  Reconfigurable Antenna for Korean WIBRO and DMB Systems  

FROF-43  Design of Magnetic Antenna with Dual Circular Polarizations  

FROF-44  Antenna Arrays with Linear and Circular Polarization for the Meteorological Radar  
S. T. Koyanare, B. A. Panchenko, and S. N. Shabunin, Ural State Technical Univ., RUSSIA

FROF-45  A Dual-Band Beam-Switched Slot Array for GSM 900/1800MHz  
Y. Liu, Z. Shen, B. Zheng, and W. Tan, Nanyang Technological Univ., SINGAPORE

FROF-46  Wide-Band Circular Antenna Arrays Consisting of Bicone, Semi Bicone or Bowtie Elements  
R. Gunnarsson, T. Martin, and A. Ouacha, Swedish Defence Research Agency, SWEDEN

FROF-47  A Four-Element Reflecto-Nulling Antenna Array  
S.-N. Hsieh and T.-H. Chu, National Taiwan Univ., TAIWAN

FROF-48  A Recursive Procedure for Evaluating the Impedance Matrix of the Peano-Gosper Fractal Array  
W. Kuhmin, Kasetnart Univ., THAILAND

FROF-49  Proximity-Coupled and Dual-Polarized Microstrip Patch Antenna for WCDMA Base Station Arrays  
J. Saily, VTT Technical Research Centre of Finland, FINLAND

FROF-50  Sidelobe Reduction in Square-Planar Fractal Arrays Synthesis Using Genetic Algorithms  
M. Polpasee and N. Homsup, Kasetnart Univ., THAILAND

FROF-51  Analysis of Mutual Coupling in MIMO Antenna Array by TARC Calculation  
S. H. Chae, W. I. Kawk, S.-O. Park, and K. Lee*, Information and Communications Univ., *Electronics and Telecommunications Research Institute, KOREA

FROF-52  Radiations from Switchable Rectangular Planar Array Antenna in L-Band  
D. Kumar and P. K. S. Pourush, Agra College, INDIA

FROF-53  Simulation Study on a Multi-band Adaptive Hemispherical Helix Array  
D. Li, Z. Feng, and L. Zhang, Tsinghua Univ., CHINA

FROF-54  A Dual Feed Switched-Beam Patch Antenna for a Phased Array of Switched-Beam Elements  
T. Taggapanji, C. Phongcharoenpanich, and M. Kratiriksh, King Mongkut’s Institute of Technology Ladkrabang, THAILAND

FROF-55  An LTCC-Based Compact Folded Rotman Lens for Phased Array Applications  
G. Tudosie and R. Vahldieck, ETH Zurich, SWITZERLAND

FROF-56  Post-IDFT Multidimensional Beamforming for STC-OFDM Systems  
H. Liu and Q. Feng, Southwest Jiaotong Univ., CHINA

FROF-57  New Methods of Reducing The Phase Quantization Error Effects on Beam Pointing and Parasitic Side Lobe Level of The Phased Array Antennas  
S. Taheri and F. Farzaneh, Sharif Univ. of Technology, IRAN

FROF-58  Experimental Study on The Radiation Beam Scan of a Waveguide Slot Array Antenna Filled with a Ferrite  
H. Shimasaki and T. Itoh, Kyoto Institute of Technology, JAPAN
The demand for small, inexpensive radio modules is increasing. RF integrated circuits on Si, which are the key components of radio modules, have evolved remarkably in recent years. RF systems on a chip (SoC) that integrate RF, analog, and digital circuits have been developed to reduce occupied circuit area and off-chip discrete components that add to assembly and test costs. Today, the RF SoC is dominant in applications such as Bluetooth and wireless LAN, and many RF SoC devices have been developed in applications such as GPS, ETC, and GSM. Moreover, the demand for multi-band and multi-mode transceivers that can be used in various applications and that are able to connect to networks anytime, anywhere using the most suitable application among all available applications is increasing. RF SoC devices are indispensable in making multi-band and multi-mode transceivers small and economical.

This workshop presents a review of the SoC developments in various applications and of the technical issues that must be overcome.

WS1-1 A 1-V operation single chip Bluetooth RF transceiver
Mitsuru Harada, NTT, Japan

WS1-2 SiGe-MMIC transceiver for 5.8GHz ETC Terminals
Noriharu Suematsu, Mitsubishi Electric Corp., Japan

WS1-3 Calibration Systems on RFICs
Satoshi Tanaka, Hitachi, Ltd., Japan

High speed transmission through a limited frequency bandwidth is strongly demanded in such systems as wireless local area networks (LANs) and cellular networks. Multiple-Input Multiple-Output (MIMO) systems that have multiple antennas at both of the transmitter and receiver in multipath channel environments have attracted much attention for these years. When independent signals are transmitted from the different antennas and they are separated at the receiver side, transmission speed is increased by the number of the transmit antennas. Also, if the transmitter side has multipath channel state information, maximum throughput can be achieved by the eigen beamforming technique. In frequency selective multipath channels, the MIMO technique is employed together with orthogonal frequency division multiplexing (MIMO-OFDM). Other than the above spatial multiplexing technique, the MIMO system can achieve reliable wireless communications by the space time coding that is a combination of the MIMO system and the coding technique.

In this workshop, starting from overview of MIMO technologies, performance evaluation of MIMO systems in home and cellular environments will be presented. Furthermore, considerations on antenna configuration of MIMO systems will be given. The workshop will be useful for understanding of the latest MIMO technologies.

WS2-1 Overview of MIMO Technologies and their Applications
Yasutaka Ogawa, Hokkaido Univ., Japan

WS2-2 Performance Evaluation of MIMO Communication Systems in Home Environment
Kei Sakaguchi, Tokyo Institute of Technology, Japan

WS2-3 MIMO Techniques and Experiments for Future Broadband Mobile Communications
Manoru Sawahashi, Kenichi Higuchi*, Hidekazu Taoka* and Dai Ki*, Musashi Institute of Technology, *NTT DoCoMo, Japan

WS2-4 Handset MIMO Technologies: Antenna Configurations, Analysis and Measurements Systems
Koichi Ogawa, Matsushita Electric Industrial Co., Ltd., Japan

Microwave and millimeter-wave technologies have been developed further and their applications have been spread widely in recent years. The standardization of these technologies which has been discussed in the International Electro-technical Commission is necessary for us to promote the international cooperation. The role of IEC, which attained the one hundredth anniversary of its existence, becomes still more important.

In this workshop, the activity of the standardization and its recent trend will be discussed at first. The actions on the standardization of the evaluation method for the microwave and millimeter-wave materials, which have been investigated in the IEC domestic committees in Japan, will be introduced subsequently.

WS3-1 Address for the 100 Anniversary IEC
Akira Izumi, Ministry of Economy, Trade and Industry, Japan

WS3-2 Standardization Activities of the IEICE Japan
Shozo Komaki, Osaka Univ., Japan
WS3-3  Activity of IEC/TC49 Japanese National Committee for Method of Complex Permittivity at Microwave and Millimeter Wave Frequencies
Hiroshi Tamura, Murata Manufacturing Co., Ltd., Japan

WS3-4  Electronic Characteristic Measurements — Surface Resistance of Superconductors at Microwave Frequencies
Haruhiko Obara and Shin Kosaka, NAIST (National Institute of Advanced Industrial Science and Technology), Japan

WS3-5  Measurement Method for Complex Permittivity of Low Loss Dielectric Materials in Microwave and Millimeter Wave Frequency Range
Akira Nakayama, Kyocera Corp., Japan

WS3-6  Measurement Methods for Reflectivity of Electromagnetic Absorbers in Millimeter Wave Frequency
Yutaka Higashida, Japan Fine Ceramics Center, Japan

WS4-4  Multipurpose Sensor RFID Tag
Jin Mitsugi, Keio Univ., Japan

Room E (311+312)

Workshop 5

Millimeter and Terahertz Wave Applications
Organizer: Tadao Nagatsuma, NTT, Japan
Chair: Tadao Nagatsuma, NTT, Japan

Electromagnetic waves called “millimeter waves” (30 GHz–300 GHz) and/or “terahertz waves” (100 GHz–10 THz) are considered to be major resources for mankind in the 21st century. These frequency bands cover interdisciplinary regions between radio waves and light waves, which are both bases of today’s telecommunications technologies, i.e., wireless and fiber-optic communications. The exploration of such undeveloped frequencies has recently been accelerated with rapid evolutions of both electronic and photonic device/circuit technologies. This workshop will address an overview of the latest development in the millimeter and terahertz-wave devices and their applications to communications, sensors and measurements. The first part of the workshop will concentrate on millimeter-wave technologies, and in the second part, emerging terahertz device technologies and their promising applications will be presented.

WS5-1  Millimeter-Wave Devices and Circuits
Toshihiko Kosugi, NTT, Japan

WS5-2  Millimeter-Wave Wireless Personal Area Network Systems
Yozo Shoji, NICT, Japan

WS5-3  Trends in Terahertz Device Technologies
Taiichi Otsuji, Tohoku Univ., Japan

WS5-4  Promising Areas of Terahertz Application
Iwao Hosako, NICT, Japan

Room F (313+314)

Workshop 6

Technical Hellenism of RF and Information Security
Organizer: Takashi Ohira, ATR, Japan
Chair: Takashi Ohira, ATR, Japan

While the demand for data communications over wireless links is rapidly growing, there is strong social interest in guarding personal information and official secrets. Wireless security is inevitable for microwave and RF systems to break through the worldwide market. This session explores span-new possibility of harmonizing two originally different technical topics: RF and security. You will find technical Hellenism between Maxwellian engineering and information theory in the three invited presentations.
WS6-1  IEEE802.15.4 Wireless Secret Key Generator  
Takashi Ohira and Hideichi Sasaoka*, ATR, *Doshisha Univ., Japan

WS6-2  Security Performance of Esparskey as Viewed from Information Theory  
Hideki Imai and Kazukuni Kobara*, Chuo Univ., *AIST, Japan

WS6-3  Mathematical Aspects Common to Microwave Filters and Elliptic Encryptrs  
Kiyomichi Araki, Tokyo Institute of Technology, Japan

Recent Progress in High Power Widegap Semiconductor Device and its Application to Wireless Communication System  
Organizer: Hajime Okumura, National Institute of Advanced Industrial Science and Technology (AIST), Japan  
Chair: Hajime Okumura, National Institute of Advanced Industrial Science and Technology (AIST), Japan

For the development of information and communication technology to support the advanced information society of the 21st century, the large-capacity high-speed information communication connecting a wide range of information processing hardware to a network is indispensable. It is wireless communication technology, together with optical communication technology. In the wireless communication, one hundred and several tens of Mbps class speed will be required for a mobile access system; and a high-power high-frequency (HF) device operating with high efficiency in the frequency range from several GHz to several tens of GHz is the most important key issue for this purpose.

In this technological domain, any essential development cannot be expected even though there are huge needs, as long as conventional semiconductor devices made of Si or GaAs are used, because the characteristic parameters of Si and GaAs are not enough as semiconductor materials. For a breakthrough in this domain, the development of high-performance devices made of widegap semiconductors such as GaN is indispensable. Recently, the innovation has come to exhibit a reality owing to the progress of device process and crystal growth technologies for the widegap semiconductors.

In this workshop, the role of wireless communication in the IT society and the present status of widegap semiconductor high-power HF devices are introduced, and the future prospect is discussed.

WS7-1  Widegap Semiconductor High-Frequency Device in Future IT Society  
Masaaki Kuzuhara, Fukui Univ., Japan

WS7-2  Physics and Prospects of III-Nitride MIS Devices  
Narihiko Maeda, NTT, Japan

WS7-3  High Power GaN-Based Heterojunction FETs for Base Station Applications  

WS8-1  Plasma and Fluid Flow in Magnetohydrodynamical Energy Conversion  
Yoshihiro Okuno, Tokyo Institute of Technology, Japan

WS8-2  Application of CIP-Based MHD Code in Astrophysics  
Takahiro Kudoh, National Astronomical Observatory of Japan, Japan

WS8-3  CIP Method of Characteristics for Maxwell Equation  
Yoichi Ogata and Takashi Yabe, Tokyo Institute of Technology, Japan

WS8-4  Modified CIP Method for Light Propagation in Absorbing Media  
Daisuke Barada*,**, Takashi Fukuda*,**, Masahide Itoh**, and Toyohiko Yatagai**, *AIST, **Univ. of Tsukuba, Japan

WS8-5  Simulation of Thermal Radiation Emitted from Atomic Lattice through CIP and MD Methods  
Takushi Kawaguchi, Teppei Masuhara, and Katsunori Hanamura, Tokyo Institute of Technology, Japan

The CIP method (Cubic Interpolated Propagation / Constrained interpolation Profile) that gives quite accurate and less-diffusive results is known as a powerful hyperbolic equations solver. The CIP method has been developed to various sophisticated versions, and although it has been applied to all kinds of phenomena like hydrodynamics for around 20 years, it is proved that CIP method is very effective for electromagnetic phenomena that can be also described by hyperbolic equations system as well, compared to the other conventional schemes.

In this workshop, new improvement of simulation techniques by CIP method and the latest practical applications of CIP method for electromagnetic phenomena will be presented. The subject matter ranges widely, such as “electromagnetic field analysis based on Maxwell’s Equations”, “plasma physics and astrophysics based on magnetohydrodynamics (MHD)” and “thermal radiation”. In order to discuss the theme from these points mentioned above, we have invited six distinguished speakers.

WS8-1  Plasma and Fluid Flow in Magnetohydrodynamical Energy Conversion  
Yoshihiro Okuno, Tokyo Institute of Technology, Japan

WS8-2  Application of CIP-Based MHD Code in Astrophysics  
Takahiro Kudoh, National Astronomical Observatory of Japan, Japan

WS8-3  CIP Method of Characteristics for Maxwell Equation  
Yoichi Ogata and Takashi Yabe, Tokyo Institute of Technology, Japan

WS8-4  Modified CIP Method for Light Propagation in Absorbing Media  
Daisuke Barada*,**, Takashi Fukuda*,**, Masahide Itoh**, and Toyohiko Yatagai**, *AIST, **Univ. of Tsukuba, Japan

WS8-5  Simulation of Thermal Radiation Emitted from Atomic Lattice through CIP and MD Methods  
Takushi Kawaguchi, Teppei Masuhara, and Katsunori Hanamura, Tokyo Institute of Technology, Japan
Phase Noise in Oscillator: An Old and Still New Technical Issue

Phase noise is an old and still new technical issue for oscillator designers. For fundamental understandings on phase noise, we need knowledge on communication system, PLL system, oscillator circuits, semiconductor devices, resonators and mathematical representation of phase noise itself. This makes difficulties for understanding of oscillator phase noise. In this workshop, phase noise is discussed from several technical aspects: (a) Phase noise influence on system performance of radio communication systems, (b) Recent progress of low phase noise oscillators on Si RF-IC, (c) Principal definition of “Leeson’s Q” for phase noise characterization, (d) Mathematical formulation method for phase noise simulation.

WS10-1 26GHz-Band UWB Ranging and Communication Systems
Yasushi Aoyagi, Masaharu Uchino*, Toshiyuki Hirose**, Kenichi Takizawa***, Kiyoshi Hamaguchi***, and Ryuji Kohno***, The Furukawa Electric Co., Ltd., *Anritsu Corp., **Siemens K.K., ***NICT, Japan

WS10-2 Inter-Vehicle Safety Communication Systems
Noriyoshi Suzuki, Toyota Central R&D Labs. Inc., Japan

WS10-3 Electrical Field Simulations of a Car and Applications

WS10-4 Millimeter-Wave Antenna Technologies for Automotive Radar and Sensor Systems
Kunio Sakakibara, Nagoya Institute of Technology, Japan

High Frequency Technologies for ITS

As further advances are made in sensing technologies and communication technologies in the future, ITS (Intelligent Transport Systems) are expected to become more comprehensive, linking vehicles to infrastructures and even to people, through information. I believe that these advances in ITS will help decrease traffic accidents, traffic congestion and environmental impact. To realize next-generation ITS, various technologies, such as those for sensing, communications, information processing and high frequency technologies, need to be developed and integrated. In this workshop, the latest vehicular communication systems and high frequency technologies for ITS will be introduced. The first two presentations will focus on UWB (Ultra Wideband) ranging and inter-vehicle communication systems for car safety. The following two presentations will focus on electromagnetic simulation technique and design of automotive microwave and millimeter-wave applications, such as tire pressure monitoring systems, millimeter-wave radar systems and so on.

WS11-5 Simulation Methods for Oscillator Noises
Makiko Okumura, Kanagawa Institute of Technology, Japan

组织者: Kenji Itoh, Mitsubishi Electric Corp., Japan
共同組織者: Takashi Ohira, ATR, Japan
主席: Kenji Itoh, Mitsubishi Electric Corp., Japan

Advanced Microwave Photonics Technologies and Their Applications

A rapid progress in broadband wireless communication technologies accelerates the realization of ubiquitous networks, where various types of wireless and broadcasting services are converged in common infrastructure. Microwave photonics (MWP) can make a great contribution towards such a convergence between fixed and mobile communication (FMC), because its wideband and transparency capability for various types of wireless communication and broadcasting services will provide a seamless connectable common platform. In this workshop, the first two presentations will introduce the latest applications of MWP technologies to mobile communications and terrestrial broadcasting networks. Furthermore, the following two presentations will focus on future millimeter-wave photonic communication networks using coherent photonic techniques and advanced microwave-lightwave convert-
er technology for RoF (radio on fiber) systems such as advanced optical SSB modulators, broadband photodetectors so on.

WS11-1 Future Millimeter-Wave Photonics Communication Networks
Toshiaki Kuri, NICT, Japan

WS11-2 Advanced Millimeter-Wave-Lightwave Converter Technology for ROF Systems
Hiroshi Murata, Osaka Univ., Japan

WS11-3 ROF Applications for Mobile Phone System Applications
Yukio Horiuchi, KDDI R&D Laboratories, Co., Ltd., Japan

WS11-4 Recent Trends of Light Microwave Fused Technology in Broadcasting
Kazuhisa Haeiwa, Hiroshima City Univ., Japan

RF BAW Filters for Mobile Communications
Organizers: Ken-ya Hashimoto, Chiba Univ., Japan
Robert Weigel, Univ. of Erlangen-Nürnberg, Germany

Chairs: Ken-ya Hashimoto, Chiba Univ., Japan
Robert Weigel, Univ. of Erlangen-Nürnberg, Germany

For long years, surface acoustic wave (SAW) filters have been widely used as the radio frequency (RF) front-end filters and duplexers for modern mobile communication systems. Recently, RF bulk acoustic wave devices (BAW) have been evolved surprisingly and are attempting to take over the current RF filter market from RF SAW devices. RF BAW devices are also paid much attention for the use as a core element for the development of sophisticated RF front-end and/or one-chip radio modules based on the system-on-chip (SoC) or system-in-package (SiP) integration with active circuitry.

In this workshop, speakers from leading-edge companies (Avagotech, Triquint/SAWTEK, Infineon Technologies, Fujitsu Labs, EPCOS) will report on the latest developments and future trends in the RF BAW devices for the mobile communications. Fabrication technologies and approaches will be discussed from various aspects for the realization of state-of-the-art RF BAW devices. Their implementation in RF modules will be demonstrated.

WS12-1 Overview of FBAR Filters, Duplexers, Quadruplexers, Quintiplexers, and Front End Modules (FEM) at Avago (formerly of Agilent)
Rich Ruby, Avagotech, U.S.A.

WS12-2 Bulk Acoustic Wave Filters for RF Applications
Gernot Fattinger, et al., TriQuint/SAWTEK, U.S.A.

WS12-3 Challenges and Success Factors of High Volume BAW Manufacturing in a CMOS Fab
Lueder Elbrecht, Infineon Technologies AG, Germany

WS12-4 FBAR and SAW Technologies and their Applications for Mobile Communications
Masanori Ueda, Fujitsu Laboratories, Japan

WS12-5 Solidly Mounted BAW Resonator Technology for Use in Mobile Communication Systems
Stefan Marksteiner, EPCOS AG, Germany
**Short Course 1**

**Room G (501)**

**Metamaterial Engineering for Microwaves**

*Lecturer:* Tatsuo Itoh, UCLA, U.S.A.

This course is intended to provide realistic approaches to applications of metamaterial structures, specifically the so-called left handed or double negative materials, for microwave engineering. After brief historical remarks, some fundamental concepts are explained. A number of microwave components with unique characteristics are presented mostly based on the transmission line approach, called the Composite Right/Left Handed structure. Classes of the components discussed are antennas, passive devices, active and nonlinear circuits, and two-dimensional beam optics structures. Engineering aspects including the fabrication issues and homogeneity problems are discussed.

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**Short Course 2**

**Room H (502)**

**Digital RF Processor (DRP™): All-Digital TX and Discrete-Time RX**

*Lecturer:* Robert Bogdan Staszewski, Texas Instruments, U.S.A.

RF circuits for multi-GHz frequencies have recently migrated to low-cost digital deep-submicron CMOS processes. Unfortunately, this process environment, which is optimized only for digital logic and SRAM memory, is extremely unfriendly for conventional analog and RF designs. We present fundamental techniques recently developed that transform the RF and analog circuit design complexity to digital domain for a wireless RF transceiver, so that it enjoys the benefits of digital approach, such as process node scaling and design automation. All-digital phase locked loop, all-digital control of phase and amplitude of a polar transmitter, and direct RF sampling techniques allow great flexibility in reconfigurable radio design. Digital signal processing concepts are used to help relieve analog design complexity, allowing one to reduce cost and power consumption in a reconfigurable design environment. The ideas presented have been used in Texas Instruments to develop two generations of commercial digital RF processors: a single-chip Bluetooth radio and a single-chip GSM radio.

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**Short Course 3**

**Room G (501)**

**RF MEMS Circuits for High Frequency Applications**

*Lecturer:* Linda Katehi and Dimitris Peroulis*, Univ. of Illinois, *Purdue Univ., U.S.A.

RF MEMS has been identified as an area which has the potential to provide a major impact on existing RF architectures in sensors (radar) and communications by reducing weight, cost, size, and power dissipation. The impact of this technology to communication system cost, size and volume is a few orders of magnitude. Key MEMS devices for current RF architectures are switches and microrelays in radar systems and filters in communications systems. Several RF MEMS switches have been developed in the past decade. The main driving force behind these efforts is the outstanding RF performance demonstrated by the MEMS devices. In most cases, RF MEMS switches have been electrostatic in nature. They have the distinct advantage of using only a few mW of DC power as compared to several mW for solid state devices. This presentation will cover a broad range of RF MEMS devices including switches and varactors and will discuss in detail issues related to device architecture and device reliability.

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**Short Course 4**

**Room H (502)**

**Wireless Communications Standards, Systems, and RFIC Specifications**

*Lecturer:* Jenshan Lin, Univ. of Florida, U.S.A.

This tutorial links RFIC design specifications and system requirements defined in wireless communications standards. Many RFIC designers design the circuits without knowing where and how the specifications come from. The objective of this tutorial is to let attendees learn how to derive RFIC specifications from wireless communication standards, tradeoffs in different transceiver architectures, and an overall picture of RFIC and wireless communication systems. As RFIC design advances from component-level building blocks to system-level integration, this link between standards and RFIC specifications is becoming more important. A reference system design of GSM receiver will be given as an example.
Microwave Exhibition 2006 will be held in association with the 2006 Asia-Pacific Microwave Conference (APMC 2006) at the Exhibition Hall A and B in Pacifico Yokohama, the venue of the conference, from Wednesday, December 13 to Friday, December 15, 2006.

More than 300 microwave-related companies from all over the world will display their latest products and services including systems, sub-systems, components, parts, materials, instruments and CAD softwares. The main language in the Exhibition Hall is Japanese.

At the same time, the following attractive programs are also featured:

- Technical seminars on the new technologies and products presented by the exhibitors.
- Tutorial lectures related to foundations for microwave semiconductor devices, active and passive circuits, and mobile & fixed telecommunication systems, provided in Japanese by Japanese authorities.
- The historical exhibition of microwave technologies in Japan, where more than 100 panels as well as products with respect to antennas, semiconductors, filters and systems will be displayed.
- Display of a satellite model and demonstration of multimedia mobile access systems in the special area.
- The university exhibition, where more than twenty universities will demonstrate their unique research activities in the field of microwaves.

This exhibition is open to all visitors with no entrance fee. In order to enter, you need to show your participant badge, which is given to you after the free registration at the reception desk in the Exhibition Hall. The Conference participants in APMC 2006 can also enter the exhibition hall freely by showing the registration nameplate. All visitors will be provided with a free guidebook. A copy of the textbook for the tutorial lectures is 2,000 JPY.

**EXHIBITORS**

(Following is the list of exhibiting companies as of August 31 and those who exhibited in 2005)

ACE TRONIX CO., LTD.
ADVANCED TECHNOLOGY, INC.
ADVANCE TEST CORP.
AET JAPAN, INC.
AGILENT TECHNOLOGIES JAPAN LTD.
AIAA-JPSC
AMTECHS CORP.
AMT INC.
ANRITSU CORP.
ANSOFT JAPAN K.K.
APELLOGWAVE CORP.
ARUMOTECH CORP.
ASASHI GLASS CO., LTD.
ATN JAPAN, LTD.
ATR
AVAGO TECHNOLOGIES JAPAN, LTD.
CADENCE DESIGN SYSTEMS, JAPAN
CANDOX SYSTEMS, INC.
CASCADE MICROTECH JAPAN, INC.
CHRONIX INC.
CIRCUIT DESIGN, INC.
COAX CO., LTD.
COMCRAFT CORP.
COMTECS CO., LTD.
CORDES DODWELL LTD.
COTEAU VERT CO., LTD.
CRC SOLUTIONS CORP.
CYBERNET SYSTEMS CO., LTD.
DAIDO STEEL CO., LTD.
DEVICE CO., LTD.
DIGITAL SIGNAL TECHNOLOGY, INC.
E&C ENGINEERING K.K.
ELENA ELECTRONICS CO., LTD.
ETS-LINDGREN JAPAN, INC.
EUDYNA DEVICES INC.
FARAD CORP.
FLOWERICS, LTD.
FREESCALE SEMICONDUCTOR JAPAN LTD.
FUJI DENKA, INC.
FUJITSU LTD.
FUJITSU MEDIA DEVICE LTD.
FUSOH SHOJI CO., LTD.
G.T. ELECTRONICS CORP.
HIGHTECH CORP.
HIROSE ELECTRIC CO., LTD.
HI-SOL, INC.
HI-TECHNOLOGY TRADING, INC.
HONDA TSUSHIN KOGYO CO., LTD.
IDAQs CO., LTD.
INNERTRON ELECTRONICS CO., LTD.
JAPAN TELEGARTNER LTD.
JUNKOSHA INC.
KANAGAWA INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE
KANTO ELECTRONICS APPLICATION & DEVELOPMENT INC.
KAWASHIMA MANUFACTURING CO., LTD.
KEISOKU ENGINEERING SYSTEM CO., LTD.
KEYCOM CORP.
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KODEN ELECTRONICS CO., LTD.
KOZO KEIKAKU ENGINEERING INC.
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MAJ CO., LTD.
MARUWA CO., LTD.
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MITSUBISHI ELECTRIC TOKKI SYSTEMS CORP.
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MKT T AISEI CO., LTD.
MMEX, INC.
MOUBIC INC.
MPD DEVICE CO., LTD.
M-RF CO., LTD.
MURATA MANUFACTURING CO., LTD.
NAGASE & CO., LTD.
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ALDETEC, INC.
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AMERICAN TECHNICAL CERAMICS CORP.
AMPLICAL CORP.
AMPLITECH, INC.
ANAREN MICROWAVE, INC.
ANTCOM CORP.
APOLLO MICROWAVES LTD.
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ATLANTIC MICROWAVE LTD.
BABCOCK, INC.
BANDWIDTH SEMICONDUCTOR, LLC
BECKELEC INC.
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CHANNEL MICROWAVE CORP.
CHIN NAN® PRECISION ELECTRONICS LTD.
CHRONIX INC.
CIOA WIRELESS, INC.
CMF ENGINEERING SALES, INC.
COM DEV LTD.
COMMERCIAL MICROWAVE TECHNOLOGY, INC.
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CUSTOM MICROWAVE, INC.
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DB CONTROL
DBP MICROWAVE
DELTA ELECTRONICS, INC.
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E2V TECHNOLOGIES
EAGLE
EAGLEWARE CORP.
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EZ FORM CABLE CORP.
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HERLEY-CTI
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HEROTEK, INC.
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IW (INSULATED WIRE INC.)
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LINX TECHNOLOGIES INC.
LITEPOINT, CORP.
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