Conference Topics

A. Disaster Monitoring (Special Session)

- A.1 Contribution of SAR remote sensing on the Great East Japan Earthquake
- A.2 ALOS-2 projects for prediction, mitigation and restoration
- A.3 SAR applications for various disasters
- A.4 Present and future SAR systems and missions in Asia-Pacific region

B. SAR Applications

- B.1 Land Use and Land Cover
- B.2 Soil and Vegetation Applications
- B.3 Atmosphere and Ocean Observation
- B.4 Snow and Ice
- B.5 Coastal and wetlands
- B.6 Others

C. Advances in Analysis Techniques

- C.1 Electromagnetic Modeling
- C.2 InSAR and High Resolution SAR
- C.3 POL and POLInSAR
- C.4 Bistatic SAR
- C.5 Others

D. SAR Signal Processing

- D.1 High Resolution SAR Processing
- D.2 SAR/GMTI/STAP and Change Detection
- D.3 Image Filtering, Correction and Enhancement
- D.4 SAR/ISAR Signal Processing
- D.5 Others

E. SAR Systems and Sensors

- E.1 Spaceborne and airborne SAR Systems and Missions
- E.2 Advanced and Innovative SAR Concepts and Modes
- E.3 Ground Based Systems
- E.4 Calibration
- E.5 Others

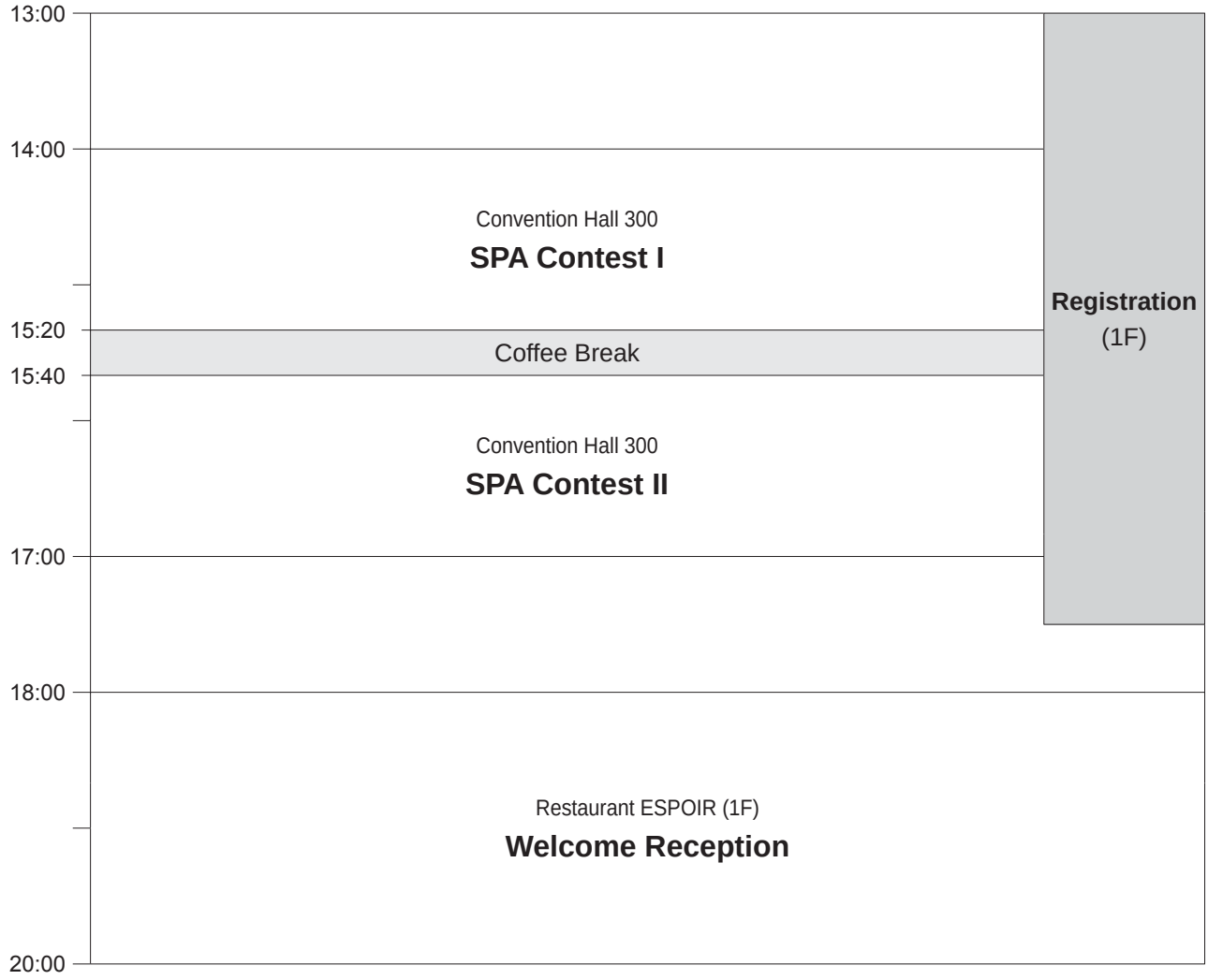
F. Radar Technology

- F.1 Radar Components and Subsystems
- F.2 Antenna Technology and Adaptive Arrays
- F.3 UWB, GPR, Bio-Medical Imaging Radar Systems
- F.4 Automotive Radar
- F.5 Others

All aspects of SAR/Radar technologies have been solicited.

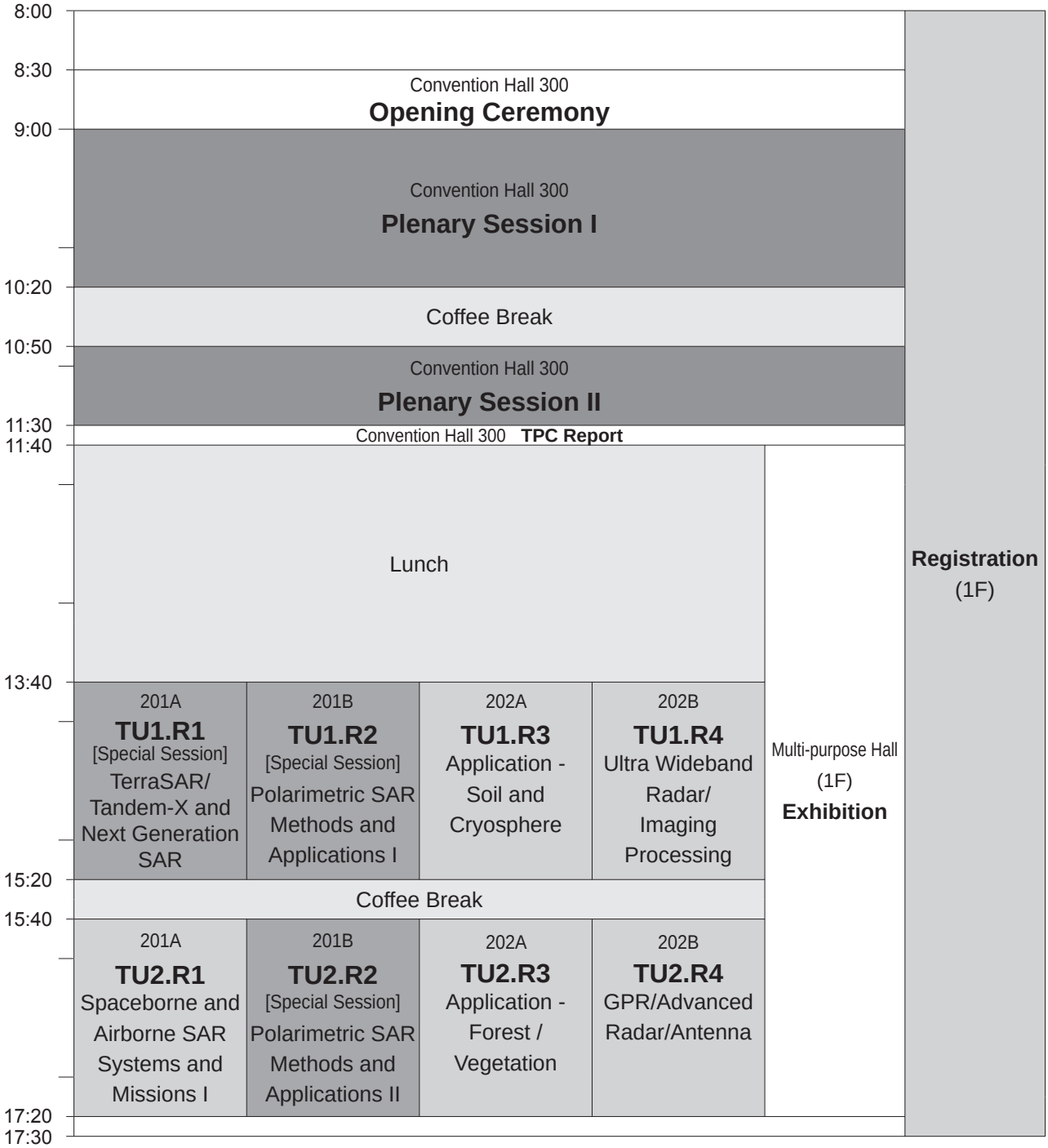
Program at a glance

Monday Sept. 23, 2013



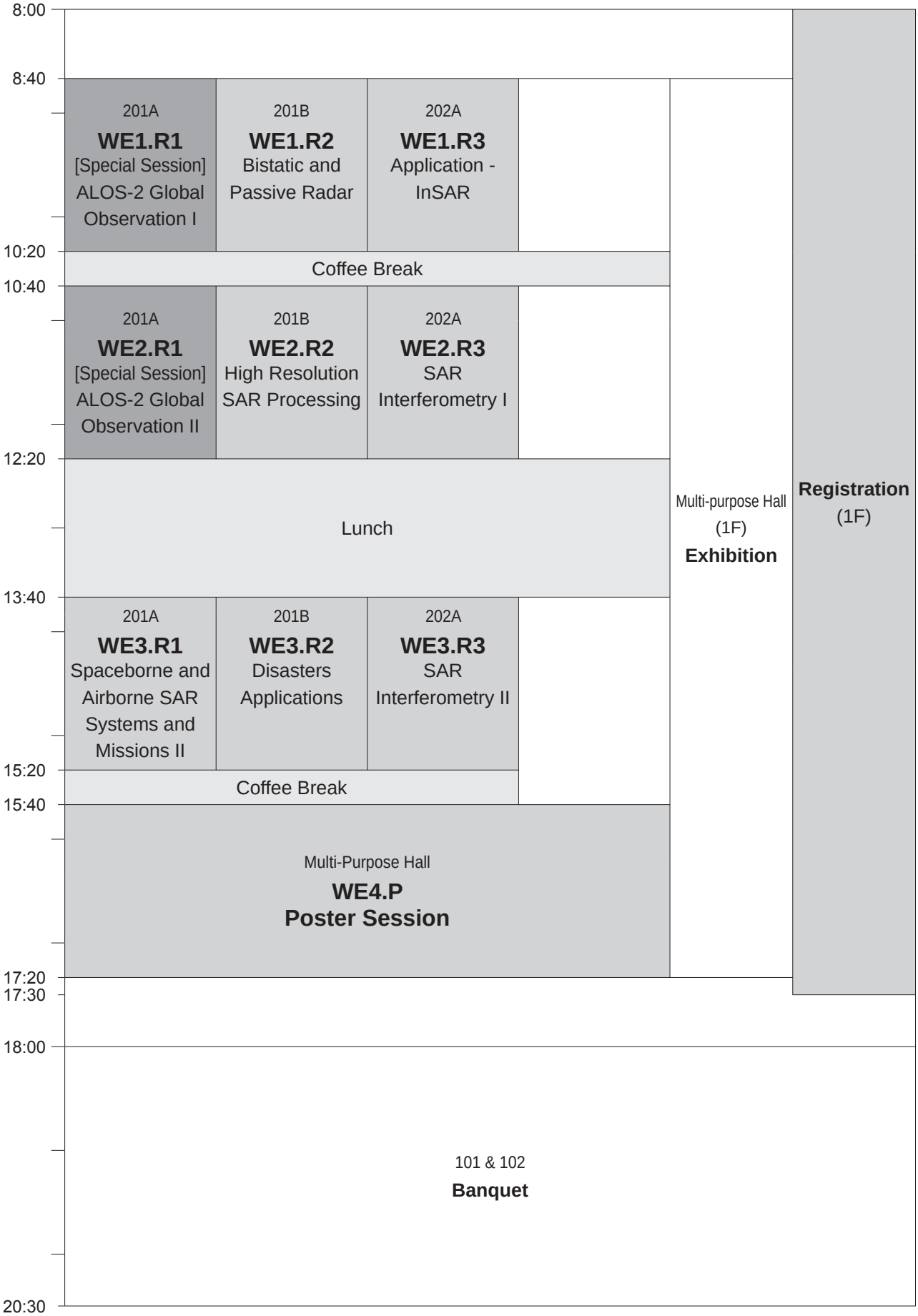
Program at a glance

Tuesday Sept. 24, 2013



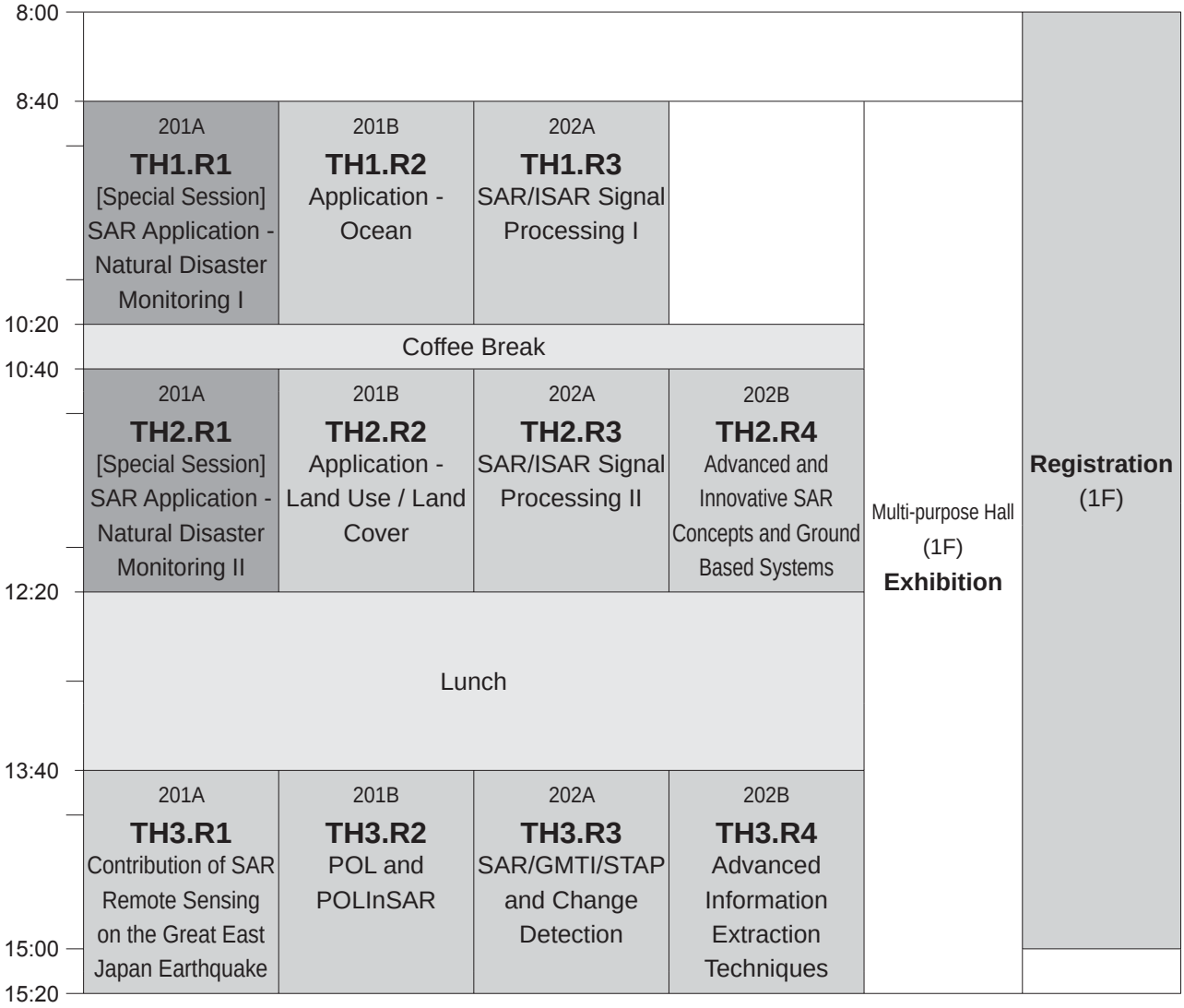
Program at a glance

Wednesday Sept. 25, 2013



Program at a glance

Thursday Sept. 26, 2013

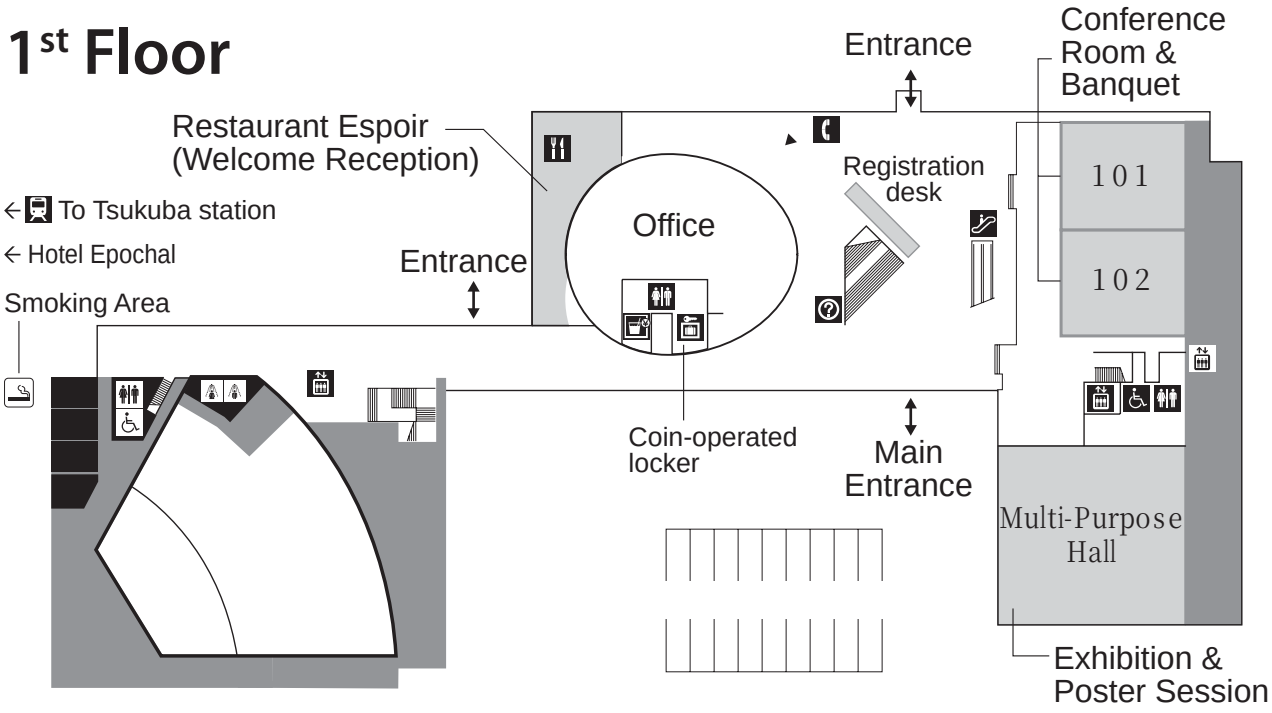


Friday Sept. 27, 2013

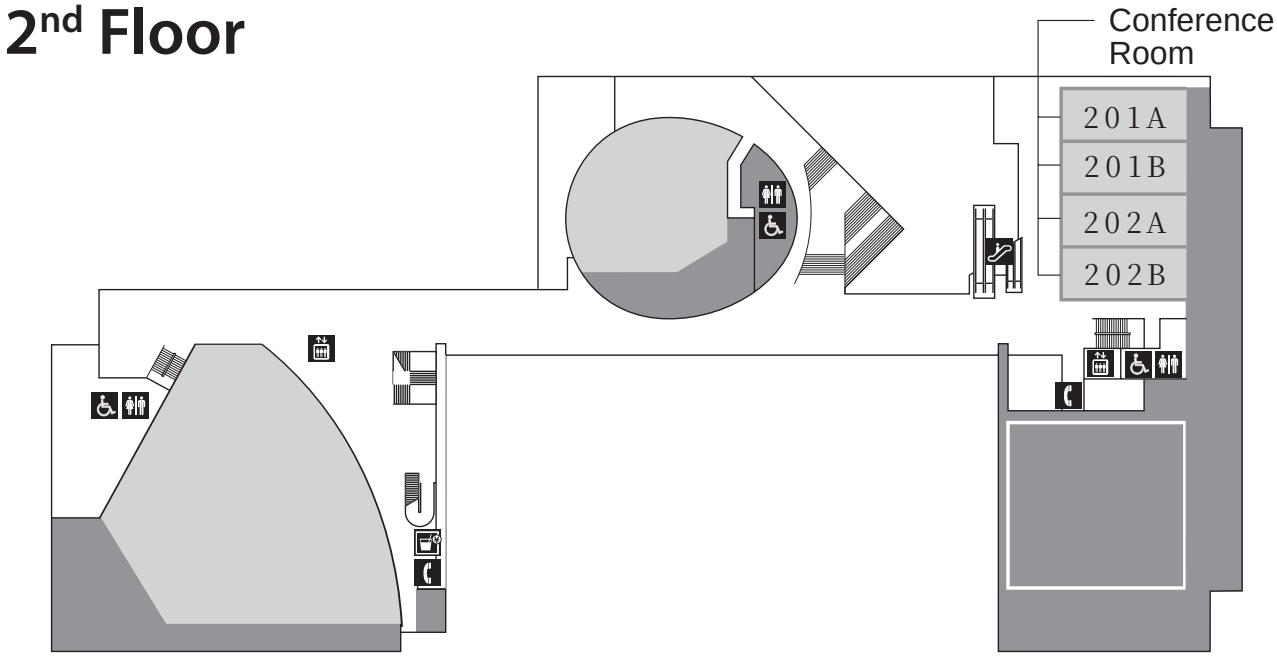
Floor Guide & Wi-Fi Internet

Tsukuba International Congress Center (Epochal Tsukuba)

1st Floor

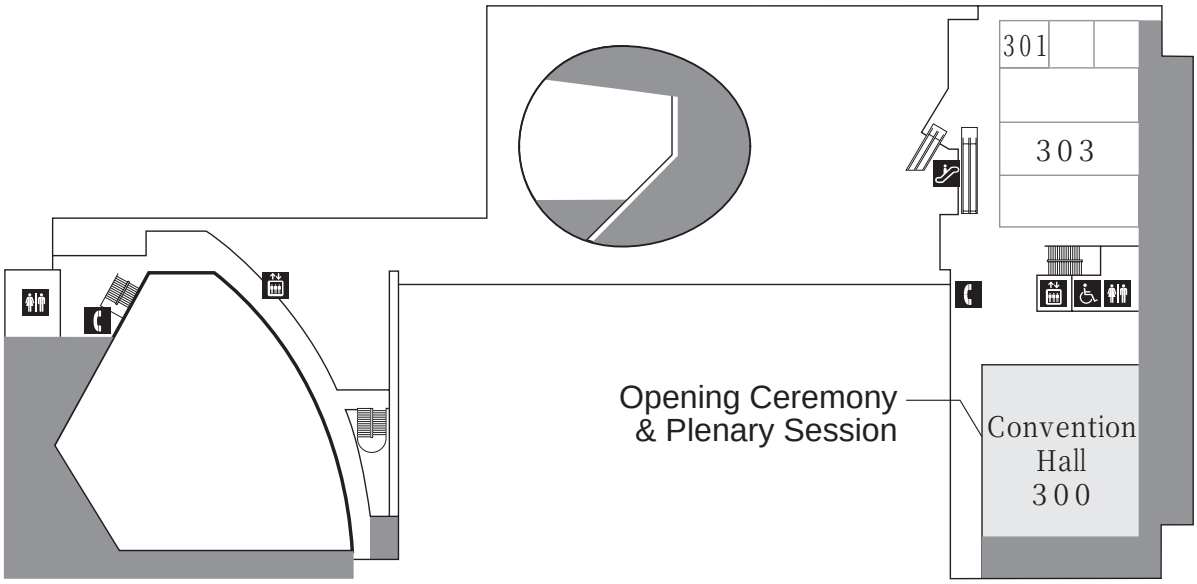


2nd Floor



Floor Guide & Wi-Fi Internet

3rd Floor



Wi-Fi Internet

A public wireless internet is available in the Congress Center.

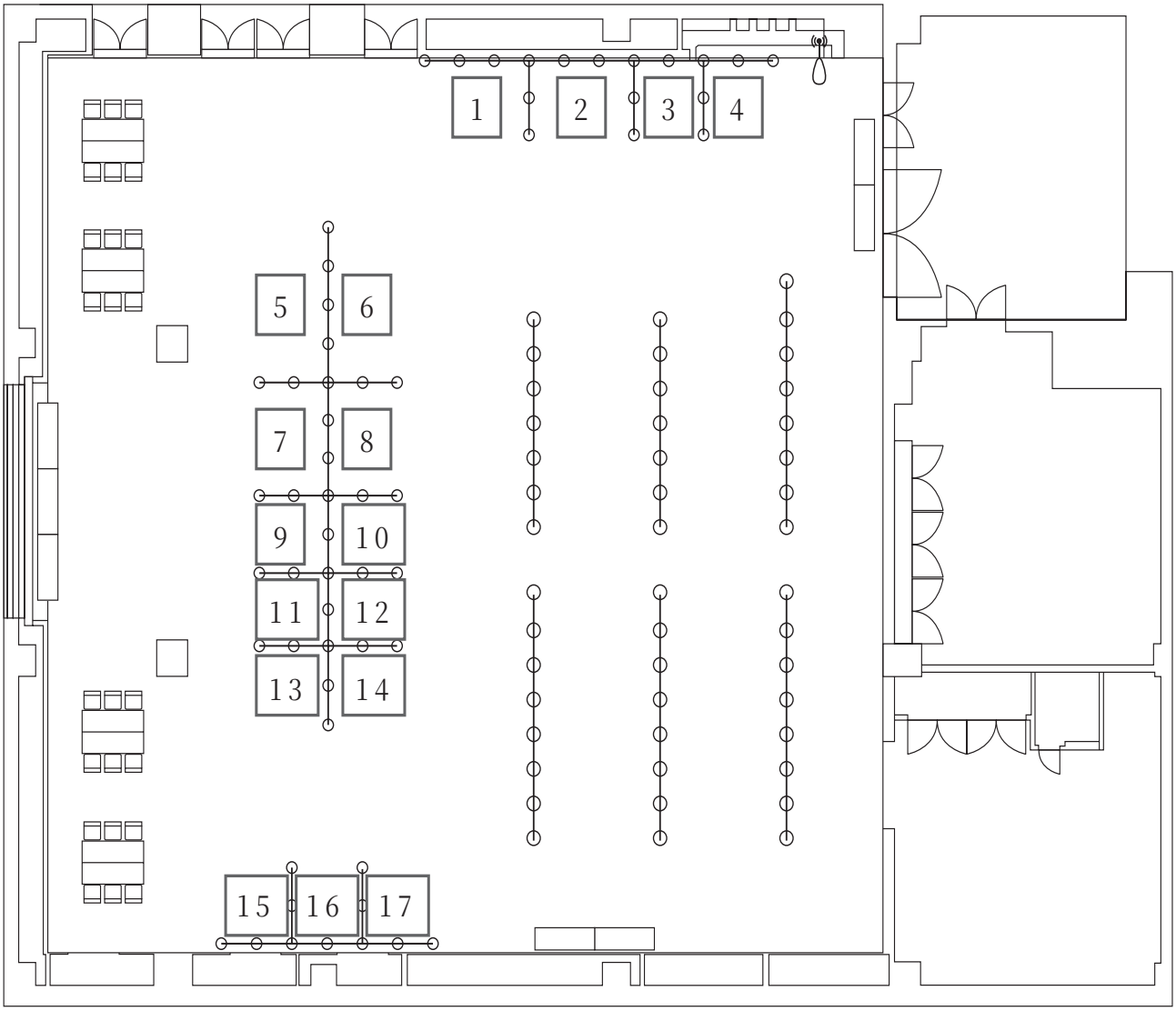
Complimentary wireless internet for the participants and the exhibiters is also available at the Multi-Purpose Hall. Please enter the following information to login:

SSID: APSAR2013

Password: access2013

Directory of Exhibitors

Multi-Purpose Hall (1st Floor)



Directory of Exhibitors

Booth #	Company name
1	Exelis Visual Information Solutions
2	Earth Observation Research Center,Japan Aerospace Exploration Agency (EORC, JAXA)
3	National Institute of Information and Communications Technology (NICT)
4	The University of Electro-Communications Inaba Laboratory
5	PASCO CORPORATION Astrium
6	MetaSensing SSBV Aerospace & Technology Group
7	NEC Corporation
8	Mitsubishi Electric Corporation
9	GAMMA Remote Sensing and Consulting AG
10	Mitsubishi Space Software Co., Ltd.
11	Japan Space Imaging Corporation
12	Remote Sensing Technology Center of Japan (RESTEC)
13	THE NIPPON SIGNAL CO.,LTD
14	ANRITSU CORPORATION
15	Rohde & Schwarz Japan
16	RFtestLab Co., Ltd.
17	Device Co., Ltd.

Presentation Instruction

GUIDELINE FOR ORAL PRESENTATIONS

- The official language of APSAR 2013 is English.
- Each oral presentation is allocated a 20 minutes time slot
  The 20 minutes includes the presentation, questions, discussions, and any setup time you use.
- Presenting authors should arrive to their session room 15-20 minutes before the session begins to meet with the session chair(s), who may be near the stage/lectern.
- Presenting authors should upload their slides to the APSAR 2013 laptop in their presentation room during the break before the session. There will be no central upload center. For speed and efficiency, we prefer to use the conference-provided computer for displaying their presentation visual aids. However, presentations from personal laptops with VGA connector are also allowed.
- Each session room will be equipped with a personal computer, LCD projector, a microphone, and a pointing device. The software installed on the provided computer includes Windows7, Microsoft Office 2010 or later, and Adobe Reader. Use of standard True Type font is suggested for Power Point presentations. In the case Power Point contains videos, please ensure that both files (Power Point and Video) are in the same folder.
- Presentation rehearsal room/area for checking the slides will be prepared in the conference hall.
- **All papers must be presented at the conference in order to be included in the published proceedings appearing in IEEE Xplore.**

GUIDELINE FOR POSTER PRESENTATIONS

- The official language of APSAR 2013 is English.
- The space available for each poster is 210cm (height)×90cm (width).
- Each poster will be attached to the face of a board. Push pins will be provided.
- Information about the location of the poster will be provided at the entrance of the poster area.
- Important points should be highlighted and arranged in a clear sequence. Graphical elements take on increased significance in the poster format and should be utilized accordingly. Do not simply reproduce your paper in large type. Poster sheets are usually arranged to be viewed from left to right and from top to bottom for an attractive and logical flow of information. If more than one page or sheet is used, it is recommended that these be numbered in the order in which the authors wish them to be viewed. Colored tape used to connect the units can be a helpful guide for the reader.
- Authors should set up their posters at least one hour before the start of the session, and must be present at their posters for the 90 minutes of the session.
- **All papers must be presented at the conference in order to be included in the published proceedings appearing in IEEE Xplore.**

Opening Ceremony and Plenary Session Schedule

Opening Ceremony 8:30-9:00 Convention Hall 300

Welcoming Address
Akira Hirose, General Chair of APSAR2013
Motoyuki Sato, Vice-chair, The Technical Committee on Electromagnetic Theory, IEICE Electronics Society
Hiroshi Kimura, Chair of IEEE Geoscience and Remote Sensing Society (GRSS) Japan Chapter

Congraturatory Address
Shizuo Yamamoto , Exclusive Director, Japan Aerospace Exploration Agency (JAXA)
Fumihiko Tomita, Vice President , National Institute of Information and Communication Technology (NICT)

Plenary session I 9:00-10:20 Convention Hall 300

9:00-9:20
Dr. Masanobu Shimada, JAXA, Japan
"New Earth Observation Scenario using the ALOS-2 with the L-band high-resolution and full-polarimetric SAR"

9:20-9:40
Dr. Wen Hong, MITL-IECAS, P.R. China
"Research Progresss on Multidimensional Space Joint-observation SAR"

9:40-10:00
Dr. Young Kil Kwag, Korea Aerospace University, Korea
"Spaceborne Synthetic Aperture Radar in Korea"

10:00-10:20
Dr. Manfred Zink, DLR, Germany
"TanDEM-X: Operational DEM Generation and Pre-Cursor for Future SAR Missions"

Plenary session II 10:50-11:30 Convention Hall 300

10:50-11:10
Mr. Robertus Heru Triharjanto, LAPAN, Indonesia
"System Design of LAPAN-CHIBA Microsatellite"

11:10-11:30
Dr. Wolfgang-Martin Boerner, UIC, USA
"The challenge for the still unresolved development of Multi-band Equatorially Orbiting POLSAR satellite sensors - an integral task for the major space-sar technology centers"

Session Timetable

Tuesday (Sept. 24)

13:40–15:20 Room 1 (201A)

TU1.R1: [Special Session] TerraSAR/Tandem-X and Next Generation SAR

Chair: **Konstantinos Papathanassiou** *(German Aerospace Center)*

TU1.R1.1 13:40 **Pol-InSAR Forest Applications by Means of TanDEM-X: Results and Experiments**
Konstantinos Papathanassiou, Florian Kugler, Astor Torano Caicoya, Matteo Padrini, Irena Hajnsek
[1]German Aerospace Centre (DLR), Germany, [2]Institute of Radio Frequency Technology and Radar Systems (DLR-HR), Germany

TU1.R1.2 14:00 **TanDEM-X Acquisition Plan and DEM Performance in the Third Year of Operation**
M. Bachmann, B. Bräutigam, D. Schulze, G. Krieger, M. Zink
German Aerospace Center (DLR), Germany

TU1.R1.3 14:20 **TerraSAR-X Staring Spotlight Mode Optimization**
Thomas Kraus, Benjamin Bräutigam, Christo Grigorov, Josef Mittermayer, Steffen Wollstadt
Microwaves and Radar Institute, German Aerospace Center (DLR), Germany

TU1.R1.4 14:40 **The Future of X-Band SAR: TerraSAR-X Next Generation and WorldSAR Constellation**
Steffen Gantert[1], Andreas Kern[1], Ralf Düring[1], Jürgen Janoth[1], Lars Petersen[1], Jörg Herrmann[2]
[1]Infoterra GmbH, Astrium Geo-Information Services, Germany, [2]Astrium GmbH, Germany

TU1.R1.5 15:00 **Astrium Technology Development for Next Generation SAR**
Jung-hyo Kim, Christoph Heer, Christoph Schaefer
Microwave Instruments, Astrium GmbH, Germany

13:40–15:20 Room 2 (201B)

TU1.R2: [Special Session] Polarimetric SAR Methods and Applications I

Co-Chairs: **Ridha Touzi** *(Canada Centre for Remote Sensing)*, **W.-M. Boerner** *(University of Illinois at Chicago)*

TU1.R2.1 13:40 **Theoretical Study of Backscatter from Rice Paddy Using Discrete Scatterer Model**
M. Arii[1], H. Kitta[1], T. Watanabe[2], H. Yamada[2]
[1]Mitsubishi Space Software Co., Ltd., Japan, [2]Graduate School of Science and Engineering, Niigata University, Japan

TU1.R2.2 14:00 **Improved Snow Wetness Estimation from Fully Polarimetric SAR Image**
M.Surendar[1], G. Singh[2], A. Bhattacharya[1], G.Venkataraman[1], P. A. Bharathi[1]
[1]Indian Institute of Technology Bombay, India, [2]Niigata University, Japan

TU1.R2.3 14:20 **Generalized Hybrid Model-Based/ Eigenvalue Decomposition**
Gulab Singh, Yoshio Yamaguchi, Sang-Eun Park
Graduate School of Science and Technology, Niigata University, Japan

TU1.R2.4 14:40 **Development of Synthetic Aperture Radar onboard Unmanned Aerial Vehicle**
Josaphat Tetuko Sri Sumantyo[1], Koo Voon Chet[2]
[1]Center for Environmental Remote Sensing, Chiba University, Japan, [2]Faculty of Engineering & Technology, Multimedia University, Malaysia

TU1.R2.5 15:00 **Implementation of High Resolution Polsar & Polinsar Imagery for Geo/bio-environmental Monitoring of Natural Hazard-prone and Man-induced Disaster Regions across Indonesia**
Wolfgang-M. Boerner[1], Josaphat Tetuko Sri Sumantyo[2], Arifin Nugroho[3], Katsumi Hattori[4]
[1]UIC-ECE/CSN-Lab, USA, [2]CEReS/ MRSL, Chiba University, Japan, [3]Sat-Syst. Consultant, GS-EES, Telkom Institute of Technology, Indonesia, [4]Earthquake Res. Ctr, Chiba-University, Japan

Session Timetable

13:40–15:20 Room 3 (202A)

TU1.R3: Application - Soil and Cryosphere
Chair: **Hiroyuki Wakabayashi** *(Nihon University)*

TU1.R3.1 13:40 **Soil Moisture Retrieval from Single-polarized Measurements of Well-calibrated Radars for Bare Soil Surfaces**
Yisok Oh, Soon-Koo Kweon, Ji-Hwan Hwang
Department of Electronic Information and Communication Engineering, Hongik University, Korea

TU1.R3.2 14:00 **Soil Moisture and Biomass Retrieval using ALOS/PALSAR Data**
Christian N. Koyama, Motoyuki Sato
CNEAS, Tohoku University, Japan

TU1.R3.3 14:20 **Polarimetric L-band ALOS for Peatland Subsurface Water Monitoring**
R. Touzi[1], K. Omari[1], G. Gosselin[1], B. Sleep[2]
[1]Canada Centre for Remote Sensing, Natural Resources Canada, Canada, [2]Alberta Environment and Sustainable Resource Development, Canada

TU1.R3.4 14:40 **A Study on Sea Ice Monitoring with SAR Data at Lake Saroma**
Hiroyuki Wakabayashi[1], Yuta Mori[1], Kazuki Nakamura[1], Kohei Osa[2], ChanSu Yang[3]
[1]College of Engineering, Nihon University, Japan, [2]Global Center, Weathernews Inc., Japan, [3]Korean Institute of Ocean Science and Technology, Korea

TU1.R3.5 15:00 **Glacier Surge in West Kunlun Shan, NW Tibet Detected by Synthetic Aperture Radar**
Takatoshi Yasuda[1], Masato Furuya[2]
[1]Graduate School of Science, Hokkaido University, Japan, [2]Department of Natural History Sciences, Hokkaido University, Japan

13:40–15:20 Room 4 (202B)

TU1.R4: Ultra Wideband Radar/Imaging Processing
Chair: **Toshio Wakayama** *(Mitsubishi Electric Corporation)*

TU1.R4.1 13:40 **Long Range Detection of UWB Radar Using Interpulse Cyclic Phase Code**
Masato Watanabe, Manabu Akita, Takayuki Inaba
Department of Mechanical Engineering and Intelligent Systems, Graduate School of Informatics and Engineering, The University of Electro-Communications, Japan

TU1.R4.2 14:00 **Accurate Permittivity Estimation Method for 3-dimensional Dielectric Object with Iterative Correction of Waveform Deformation**
Ryunosuke Souma[1], Shouhei Kidera[2], Tetsuo Kirimoto[2]
[1]Kyosan Electric Manufacturing Co., Ltd, Japan, [2]Graduate School of Informatics and Engineering, University of Electro-Communications, Japan

TU1.R4.3 14:20 **Extended Imaging Method Using Range-Points-Based Ellipse Extrapolation with Double-Scattered Waves for UWB Radar**
Ayumi Yamaryo, Shouhei Kidera, Tetsuo Kirimoto
Graduate School of Informatics and Engineering, University of Electro-Communications, Japan

TU1.R4.4 14:40 **A Novel Approach of High Spatial-Resolution Microwave Staring Imaging**
Xuezhi He, Bo Liu, Shougang Chai, Dongjin Wang
Department of Electronic Engineering and Information Science, University of Science and Technology of China, China

Session Timetable

15:40–17:20 Room 1 (201A)

TU2.R1: Spaceborne and Airborne SAR Systems and Missions I

Chair: **Makoto Satake** *(NICT)*

TU2.R1.1 15:40 **Polarimetric Calibration of Pi-SAR2**
Makoto Satake, Tatsuharu Kobayashi, Jyunpei Uemoto, Toshihiko Umehara, Shoichiro Kojima, Takeshi Matsuoka, Akitsugu Nadai, Seiho Uratsuka
Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology (NICT), Japan

TU2.R1.2 16:00 **Newly Developed X-band SAR System onboard Japanese Small Satellite "ASNARO-2"**
Y. Yokota, Y.Okada, K. Iribe, M. Tsuji, A. Ando, Y. Kunii
Mitsubishi Electric Corporation, Kamakura Works, Japan

TU2.R1.3 16:20 **NovaSAR-S: A Low Cost Approach to SAR Applications**
Rachel Bird[1], Philip Whittaker[1], Ben Stern[1], Nil Angli[1], Martin Cohen[2], Raffaella Guida[3]
[1]Surrey Satellite Technology Ltd, UK, [2]EADS Astrium, UK, [3]Surrey Space Centre, University of Surrey, UK

TU2.R1.4 16:40 **Synthetic Aperture Radar Compatible with 100kg Class Piggy-Back Satellite**
Hirobumi Saito[1], Atsushi Tomiki[1], Prilando Rizki Akbar[1], Takashi Ohtani[2], Kunitoshi Nishijo[2], Jiro Hirokawa[3], Makoto Ando[3]
[1]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, Japan, [2]Aerospace Research & Development Directorate, JAXA, Japan, [3]Tokyo Institute of Technology, Japan

15:40–17:20 Room 2 (201B)

TU2.R2: [Special Session] Polarimetric SAR Methods and Applications II

Co-Chairs: **Ridha Touzi** *(Canada Centre for Remote Sensing)*, **W.-M. Boerner** *(University of Illinois at Chicago)*

TU2.R2.1 15:40 **Comparison of Model-Based Four-Component Scattering Power Decompositions**
Yoshio Yamaguchi, Gulab Singh, Cui Yi, Sang Eun Park, Hiroyoshi Yamada, Ryoichi Sato
Niigata University, Japan

TU2.R2.2 16:00 **Multi-frequency Polarimetric Analysis of Sea Ice**
T. Eltoft[1,4], J. Grahn[1], A. Doulgeris[1], C. Brekke[1], L. Ferro-Famil[1,2], B. Holt[3]
[1]Department of Physics and Technology, University of Tromsø, Norway, [2]IETR, University of Rennes 1, France, [3]Jet Propulsion Laboratory, California Institute of Technology, USA, [4]Northern Research Institute, Norway

TU2.R2.3 16:20 **The Generalized Statistical Complexity of PolSAR Data**
Alejandro C. Frery[1], Eliana S. de Almeida[1], Osvaldo A. Rosso[1,2]
[1]LaCCAN – Laboratório de Computação Científica e Análise Numérica, Universidade Federal de Alagoas, Brazil, [2]Laboratorio de Sistemas Complejos, Facultad de Ingeniería, Universidad de Buenos Aires, Argentina

TU2.R2.4 16:40 **Feature Extraction and Classification of PolSAR Images Based on Sparse Decomposition Theory**
Bin Zou, Da Lu, Lamei Zhang
Dept. of Information Engineering, Harbin Institute of Technology, China

TU2.R2.5 17:00 **Ship Detection Using Polarimetric RADARSAT-2**
R. Touzi[1], J. Hurley[2], P.W. Vachon[3]
[1]Canada Centre for Remote Sensing, Canada, [2]MDA, Canada, [3]Defence Research and Development Canada, Canada

Session Timetable

15:40–17:00 Room 3 (202A)

TU2.R3: Application - Forest / Vegetation
Chair: **Akira Kato** *(Chiba University)*

TU2.R3.1 15:40 **L-band SAR Data and Spatially Explicit Model to Analyse Forest Loss between 2007 and 2030 in Central Sumatra**
Rajesh Bahadur Thapa, Masanobu Shimada, Manabu Watanabe, Takeshi Motohka, Tomohiro Shiraishi
Earth Observation Research Center, Japan Aerospace Exploration Agency (JAXA), Japan

TU2.R3.2 16:00 **Use of L-band PALSAR Backscattering Intensity for Estimating the Growing Stages of the Forest**
Kazadi Sanga-Ngoie[1], Kotaro Iizuka[2], Shoko Kobayashi[1]
[1]Graduate School of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan, [2]Graduate School of Science, Chiba University, Japan

TU2.R3.3 16:20 **Evaluation of Multi-sensor SAR and Optical Data to Monitor Growth Stages of Oilpalm Plants**
Ram Avtar[1,2] , R. Ishii[1], H. Kobayashi[1], H. Fadaei[1], S. Herath[2], R. Suzuki[1]
[1]Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan, [2]United Nations University, Institute for Sustainability and Peace (UNU-ISP), Japan

TU2.R3.4 16:40 **Field Tree Measurement using Terrestrial Laser for Radar Remote Sensing**
Akira Kato[1], Manabu Watanabe[2], Justin Morgenroth[3], Christopher Gomez[4]
[1]Graduate School of Horticulture, Chiba University, Japan, [2]Earth Observation Research Center, Japan Aerospace Exploration Agency, Japan, [3]School of Forestry, College of Engineering, University of Canterbury, New Zealand, [4]Department of Geography, University of Canterbury, New Zealand

15:40–17:20 Room 4 (202B)

TU2.R4: GPR/Advanced Radar/Antenna
Chair: **Kazunori Takahashi** *(Tohoku University)*

TU2.R4.1 15:40 **Non-destructive Inspection of Buildings Using Radar Polarimetry**
Saika Okamura, Kazunori Takahashi, Motoyuki Sato
Center for Northeast Asian Studies, Tohoku University, Japan

TU2.R4.2 16:00 **Correction Formulae for Soil Roughness Parameters Estimated from a Surface Profile**
Masahiko Nishimoto
Graduate School of Science and Technology, Kumamoto University, Japan

TU2.R4.3 16:20 **Denoising and Detection of Reflected Waves from Buried Pipes with Ground-penetrating Radar Data**
Yoshihiro Ogino[1], Tomohiro Uchikado[1], Kazushi Nakano[1], Yasuyuki Nakamura[2], Tomohisa Ogawa[2], Takashi Matsuyama[2]
[1]Department of Mechanical Engineering and Intelligent Systems, The University of Electro-Communications, Japan, [2]The Nippon Signal Co., Ltd., Japan

TU2.R4.4 16:40 **Design of a GPR Antenna Array for Asphalt Pavement Inspection**
Hai Liu, Motoyuki Sato
Center for Northeast Asian Studies, Tohoku University, Japan

TU2.R4.5 17:00 **Road Watch Radar Development for Obstacle Detection and Warning**
Jung S. Jung, Hee J. Yang, Young H. Seo, Young K. Kwag
Department of Electronic Engineering and Avionics, Korea Aerospace University, Korea

Session Timetable

Wednesday (Sept. 25)

8:40–10:20 Room 1 (201A)

WE1.R1: [Special Session] ALOS-2 Global Observation I

Co-Chairs: **Masanobu Shimada** *(JAXA)*, **Manabu Watanabe** *(JAXA)*

WE1.R1.1 8:40 **System Characteristics for Wide Swath L-band SAR onboard ALOS-2/ PALSAR-2**
Y.Okada[1], S. Nakamura[1], K. Iribe[1], Y. Yokota[1], M. Tsuji[1], K.Hariu[1], Y.Kankaku[2], S.Suzuki[2], Y.Osawa[2], M.Shimada[2]
[1]Mitsubishi Electric Corporation, Japan, [2]Japan Aerospace Exploration Agency, Japan

WE1.R1.2 9:00 **Characteristic of L-band SAR Ocean Measurements**
Osamu Isoguchi[1], Masanobu Shimada[2]
[1]Remote Sensing Technology Center of Japan, Japan, [2]Japan Aerospace Exploration Agency, Japan

WE1.R1.3 9:20 **Autonomous Precision Orbit Control of ALOS-2 for Repeat-Pass SAR Interferometry**
Toru Yamamoto[1], Isao Kawano[1], Takanori Iwata[1], Yoshihisa Arikawa[1], Hiroyuki Itoh[1], Masayuki Yamamoto[2], Ken Nakajima[2]
[1]Japan Aerospace Exploration Agency, Japan, [2]Mitsubishi Space Software Co., Ltd., Japan

WE1.R1.4 9:40 **Efficient Motion Compensation of SAR Imagery by Refocusing Approach**
Motofumi Arii
Mitsubishi Space Software Co., Ltd., Japan

WE1.R1.5 10:00 **Trial Biomass Map Production in Riau Province, Indonesia Using L-band SAR Data**
Manabu Watanabe, Takeshi Motohka, Rajesh Bahadur Thapa, Tomohiro Shiraishi, Masanobu Shimada
Earth Observation Research Center, Japan Aerospace Exploration Agency (JAXA), Japan

8:40–9:40 Room 2 (201B)

WE1.R2: Bistatic and Passive Radar

Chair: **Seisuke Fukuda** *(JAXA)*

WE1.R2.1 8:40 **An Experiment of Ku-band Airborne Bistatic SAR with a Stationary Receiver**
Kazuhiko Yamamoto[1], Kei Suwa[1], Masayoshi Tsuchida[1], Tomoya Yamaoka[1], Jun Endo[2], Kei Hayashi[2], Hideki Hasegawa[2], Toshio Wakayama[1]
[1]Information Technology R&D Center, Mitsubishi Electric Corporation, Japan, [2]Kamakura Works, Mitsubishi Electric Corporation, Japan

WE1.R2.2 9:00 **An Effective CLEAN Algorithm for Interference Cancellation and Weak Target Detection in Passive Radar**
Bin Feng, Tianyun Wang, Changchang Liu, Chang Chen, Weidong Chen
Department of EEIS, University of Science and Technology of China, China

WE1.R2.3 9:20 **Quasi-Monostatic Algorithm for GNSS-SAR**
Takuji Ebinuma, Yoshinori Mikawa, Shinichi Nakasuka
Department of Aeronautics and Astronautics, The University of Tokyo, Japan

Session Timetable

8:40–10:20 Room 3 (202A)

WE1.R3: Application - InSAR

Chair: **Masato Furuya** *(Hokkaido University)*

WE1.R3.1 8:40 **Subsidence Monitoring Using SAR Interferometry Time Series Analysis along the Chao Phraya River Areas**
Akiko Tanaka, Aritoshi Mio
Geological Survey of Japan, AIST, Japan

WE1.R3.2 9:00 **Long-term Monitoring of Datun Volcanoes Using Multiple SAR Data**
Shih-Yuan Lin[1], Yi-Ning Hung[1], Jung-Rack Kim[2], Chia-Sheng Hsieh[3]
[1]Department of Land Economics, National Chengchi University, Taiwan, [2]Department of Geoinformatics, University of Seoul, Korea, [3]Department of Civil Engineering, National Kaohsiung University of Applied Sciences, Taiwan

WE1.R3.3 9:20 **InSAR Observation and Numerical Modeling of the Water Vapor Signal during 2008 Seino Heavy Rain Event, Central Japan**
Youhei Kinoshita[1], Masanobu Shimada[2], Masato Furuya[1]
[1]Department of Natural History Sciences, Hokkaido University, Hokkaido, Japan, [2]Earth Observation Research Center, Japan Aerospace Exploration Agency, Japan

WE1.R3.4 9:40 **Measurements of Surface Deformation of Ice Sheets in Antarctica Using TanDEM-X Data**
Seung Hee Kim, Duk-jin Kim
School of Earth and Environmental Sciences, Seoul National University, Korea

WE1.R3.5 10:00 **Some Results of Long Term Geodynamic Monitoring of Oil and Gas Fields and Power Engineering Infrastructure Using ENVISAT and ALOS SAR Data**
Anton Filatov, Arkadiy Evtyushkin, Vitalii Bryksin
Research Institute of Applied Informatics and Mathematical Geophysics, Immanuel Kant Baltic Federal University, Russia

Session Timetable

10:40–12:20 Room 1 (201A)

WE2.R1: [Special Session] ALOS-2 Global Observation II

Co-Chairs: **Masanobu Shimada** *(JAXA)*, **Manabu Watanabe** *(JAXA)*

WE2.R1.1 10:40 **Results from ALOS and Expectations to ALOS-2 in Earthquake/volcano Research**
Taku Ozawa, Yousuke Miyagi
Department of Monitoring and Forecasting Research, National Research Institute for Earth Science and Disaster Prevention, Japan

WE2.R1.2 11:00 **Ionospheric Effects Correction of ALOS PALSAR Interferometry in Antarctica**
Hiroshi Kimura[1], Taiki Andoh[2]
[1]Department of Electrical, Electronic and Computer Engineering, Gifu University, Japan, [2]Graduate School of Engineering, Gifu University, Japan

WE2.R1.3 11:20 **Monitoring Changes in Tropical Forests Using L-band Synthetic Aperture Radar Data**
Takeshi Motohka,
Masanobu Shimada, Manabu Watanabe, Noriyuki Kawano, Tomohiro Shiraishi, Rajesh Bahadur Thapa
Japan Aerospace Exploration Agency (JAXA), Japan

WE2.R1.4 11:40 **Calibration and Validation of the Pi-SAR-L2**
Masanobu Shimada, Noriyuki Kawano, Manabu Watanabe, Takeshi Motooka, Masato Ohki
Earth Observation Research Center, Japan Aerospace Exploration Agency, Japan

WE2.R1.5 12:00 **Monitoring of the Changes of Glacier and Ice Sheet on Polar Region by L-band SAR data**
Tsutomu Yamanokuchi[1], Koichiro Doi[2], Kazuki Nakamura[3], Shigeru Aoki[4], Kazuo Shibuya[2]
[1]Remote Sensing Technology Center of Japan (RESTEC), Japan, [2]National Institute of Polar Research (NIPR), Japan, [3]Nihon University, Japan, [4]Institute of Low Temperature Science, Hokkaido University, Japan

10:40–12:00 Room 2 (201B)

WE2.R2: High Resolution SAR Processing

Chair: **Jung-hyo Kim** *(EADS Astrium GmbH)*

WE2.R2.1 10:40 **Second Order Motion Compensation for Squinted Spotlight Synthetic Aperture Radar**
Minh Phuong Nguyen,
Samer Ben Ammar
Laboratorium für Informationstechnologie, Leibniz Universität Hannover, Germany

WE2.R2.2 11:00 **Multichannel Full-aperture Azimuth Processing for Beam Steering SAR**
Guang-Cai Sun[1], Meng-dao Xing[1], Xiang-Gen Xia[2], Yu-feng Wu[1], Zheng Bao[1]
[1]State Key Lab for Radar Signal Processing, Xidian University, China, [2]Department of Electrical and Computer Engineering, University of Delaware, USA

WE2.R2.3 11:20 **Ghost Target Suppression in GMTI Using Multi-Channel SAR System**
Lei Guo[1,2], Robert Wang[1,2], Yunkai Deng[1,2], Wei Xu[1,2]
[1]Department of Space Microwave Remote Sensing System, Institute of Electronics, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

WE2.R2.4 11:40 **A New Approach of FMCW-DBS Altimeters for Terrain-aided Navigation**
Sanghyuck Choi[1], Joohwan Chun[1], Inchan Paek[2], Kyungju Yoo[2]
[1]Department of Electrical Engineering, Korea Advanced Institute of Science and Technology, Korea, [2]PGM Center, Samsung Thales Co., Korea

Session Timetable

10:40–12:00 Room 3 (202A)

WE2.R3: SAR Interferometry I

Chair: **Yo Fukushima** *(Kyoto University)*

WE2.R3.1 10:40 **Performance Improvement of InSAR Local Co-registration Method with Multiresolution Interferogram**
Ryo Natsuaki, Akira Hirose
Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan

WE2.R3.2 11:00 **3D Terrain Information Reconstruction Application for Airborne InSAR**
Shiori Kyu[1], Tomoko Ishii[1], Kenzaburo Hagiwara[1], Masanori Miyawaki[1], Takashi Fujimura[2], Tsunekazu Kimura[2], Toshihiko Umehara[3], Tatsuharu Kobayashi[3]
[1]NEC Aerospace Systems, Ltd., Japan, [2]NEC Corporation, Japan, [3]National Institute of Information and Communications Technology (NICT), Japan

WE2.R3.3 11:20 **InSAR Phase Filtering in Wavelet Domain**
Lu Liu[1,2], Yongqiang Chen[2], Robert Wang[2], Yunkai Deng[2], Kun Wu[1,2], Yongchun Lu[3]
[1]Department of Space Microwave Remote Sensing System, Institute of Electronics, Chinese Academy of Sciences, China, [2]The University of Chinese Academy of Sciences, China, [3]China Centre for Resources Satellite Data and Application, China

WE2.R3.4 11:40 **Correction of DInSAR Noise Using GNSS Measurements**
Yo Fukushima
Disaster Prevention Research Institute, Kyoto University, Japan

Session Timetable

13:40–15:00 Room 1 (201A)

WE3.R1: Spaceborne and Airborne SAR Systems and Missions II

Co-Chairs: **Takeshi Motooka** *(JAXA)*, **Josaphat Tetuko Sri Sumantyo** *(Chiba University)*

WE3.R1.1 13:40 **The Aftermath of Hurricane Sandy, Imaged with the Modular, Multi-Band SlimSAR**
Evan C. Zaugg, Matthew C. Edwards
ARTEMIS, Inc. USA

WE3.R1.2 14:00 **Azimuth Ambiguity Suppression with Triple Channel Receivers -- An Experiment Result using Airborne Ku-Band Synthetic Aperture Radar --**
Masayoshi Tsuchida[1], Tomoya Yamaoka[1], Kei Suwa[1], Kazuhiko Yamamoto[1], Toshio Wakayama[1], Shohei Nakamura[2], Hideki Hasegawa[2], Kei Hayashi[2], Jun Endo[2], Yosuke Nakano[2]
[1]Information Technology R&D Center, Mitsubishi Electric Corporation, Japan, [2]Kamakura Works, Mitsubishi Electric Corporation, Japan

WE3.R1.3 14:20 **First Results from the MetaSensing Airborne Moving Target Indication and Tracking System**
Linda Corucci, Adriano Meta
MetaSensing BV, The Netherlands

WE3.R1.4 14:40 **Present and Future of L band SAR for Small Satellites**
Korehiro Maeda
Innovative Nano Satellite Technology Center, The University of Tokyo, Japan

13:40–15:20 Room 2 (201B)

WE3.R2: Disasters Applications

Chair: **Motofumi Arii** *(MSS)*

WE3.R2.1 13:40 **Automatic Detection of Landslides from SAR Images: Application to the 2011 Kii Landslides**
Masumi Yamada, Manabu Hashimoto, Yo Fukushima, Yuki Matsushi, Masahiro Chigira
Disaster Prevention Research Institute, Kyoto University, Japan

WE3.R2.2 14:00 **Deformation Parameter Estimation in Low-coherence Areas Using a Multi-satellite InSAR Approach**
Yu Morishita[1], Ramon F. Hanssen[2]
[1]Geodetic Department, Geospatial Information Authority of Japan (GSI), Japan, [2]Department of Geoscience and Remote Sensing, Delft University of Technology, The Netherlands

WE3.R2.3 14:20 **Landuse/Landcover Based Flood Area Assessment Using L- and C-band SAR Data of Coastal Region of Andhra Pradesh, India**
R. Manavalan[1], Y.S. Rao[1], B. Krishna Mohan[1], G. Venkataraman[1], Chattopadhyay Subrata[2]
[1]Centre of Studies in Resources Engineering, Indian Institute of Technology, India, [2]Centre for Development of Advanced Computing, India

WE3.R2.4 14:40 **Development of Spotlight Mode SAR "Live SAR" for Flood Area Surveillance**
Yuichiro Kogi[1], Hiroyuki Iķezi [2], Atsushi Mase [2], Naoki Ito[2], Motoyuki Sato[3], Akihiro Suzuki[4], Fuminori Sakai[5], Shintaro Mizukami[6], Katsushige Kamewari[6], Masaaki Inutake[7]
[1]Department of Engineering, Fukuoka Institute of Technology, Japan, [2]Art, Science and Technology Center for Cooperative Research, Kyushu University, Japan, [3]Center for Northeast Asia Studies, Tohoku University, Japan, [4]Smll business owner, Japan, [5]Sakura Tech Corp., Japan, [6]Tamagawa Seiki CO., LTD., Japan, [7]Research Institute of Electrical Communication, Tohoku University, Japan

WE3.R2.5 15:00 **A Small Satellite C-band SAR Mission Payload Definition for Disasters Management**
James Yu-Chen Yaung[1], Kun-Shan Chen[2], Shyh-Jong Chung[3], Shiann-Jeng Yu[1], Hao-Lun Hung[2], Yun-Jui Lee[3], Bor-Han Wu[1], Chih-Li Chang[1], I-Young Tarn[1], Nai-Chen Liu[1], Chih-Yuan Chu[2], Ru-Muh Yang[1], Ming-Yuan Yeh[1], Tung-Hung Tsai[1]
[1]National Space Organization, National Applied Research Laboratories, Taiwan, [2]Communication Research Center, National Central University, Taiwan, [3]Institute of Communication Engineering, National Chiao-Tung University, Taiwan

Session Timetable

13:40–15:00 Room 3 (202A)

WE3.R3: SAR Interferometry II

Chair: **Tatsuharu Kobayashi** *(NICT)*

WE3.R3.1 13:40 **Zero-Bandwidth SAR (ZB-SAR) for Sub-Surface Imaging**
Keith Morrison[1], John Bennett[2]
[1]Department of Informatics and Systems Engineering, Cranfield University, UK, [2]Private consultant (retired), UK

WE3.R3.2 14:00 **Proposal of Nonhollow Singularity-Spreading Phase Unwrapping**
Gen Oshiyama[1], Akira Hirose[2]
[1]Department of Bioengineering, The University of Tokyo, Japan, [2]Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan

WE3.R3.3 14:20 **SAR Interferometric Phase and Skew Fractional Brownian Motion Model**
Donny Danudirdjo, Akira Hirose
Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan

WE3.R3.4 14:40 **Performance Analysis of GPU-based SAR and Interferometric SAR Image Processing**
Achille Peternier[1], Marco Defilippi[2], Paolo Pasquali[2], Alessio Cantone[2], Rolf Krause[1], Raffaele Vitulli[3], Fumitaka Ogushi[4], Alberto Meroni[4]
[1]Institute of Computational Science (ICS), University of Lugano (USI), Switzerland, [2]Sarmap SA, Switzerland, [3]ESA-ESTEC,The Netherlands, [4]Exelis VIS K.K., Japan

Poster

15:40-17:20 Room 5 (Multi-Purpose Hall)

A. Disaster Monitoring

Co-Chairs: **Takeo Tadono** *(JAXA)*, **Ryoichi Sato** *(Niigata University)*

WE4.P A.1 **Multi-band Spaceborne SAR Observations of Tsunami Damaged Agricultural Fields**
Chinatsu Yonezawa[1], Manabu Watanabe[2], Genya Saito[3]
[1]Graduate School of Agricultural Science Faculty of Agriculture, Tohoku University, Japan, [2]Earth Observation Research Center, Japan Aerospace Exploration Agency, Japan, [3]Innovative Research-initiatives, Tokyo Institute of Technology, Japan

WE4.P A.2 **Experiment Study on Deformation Monitoring Using Ground-Based SAR**
Yang Xiaolin[1,2,3], Wang Yanping[1,2], Qi Yaolong[1,2], Tan Weixian[1,2], Hong Wen[1,2]
[1]Institute of Electronics, Chinese Academy of Sciences(IECAS), China, [2]Science and Technology on Microwave Imaging Laboratory, China, [3]University of Chinese Academy of Science, China

WE4.P A.3 **Landslide Risk Assessment with Multi Pass DInSARanalysis : A Case Study over Uljin, Korea**
Hyewon Yun[1], Jung Rack Kim[1], Shih-Yuan Lin[2], JaeMyeong Kim[1], HoJoon Park[1]
[1]Department of Geoinformatics, University of Seoul, Korea, [2]Department of Land Economics, National Chengchi University, Taiwan

WE4.P A.4 **Changes of Polarimetric Scattering Characteristics of ALOS PALSAR Caused by Volcanic Ash Fall Analyzed by the Unsupervised Wishart Classifier**
Hiroshi Ohkura
Department of Global Environment Studies, Hiroshima Institute of Technology, Japan

WE4.P A.5 **An Integrated Software Package for the Measurement, Monitoring and Modelling of Geophysical Phenomena**
Simone Atzori[1,2], Paolo Pasquali[2], Alessio Cantone[2], Marco De Filippi[2], Paolo Riccardi[2], Fumitaka Ogushi[3], Alberto Meroni[3]
[1]Istituto Nazionale di Geofisica e Vulcanologia (INGV), Italy, [2]Sarmap s.a, Switzerland, [3]Exelis VIS K.K., Japan

B. SAR Applications

WE4.P B.1 **Curvelet-Based Change Detection of Urban Land-Covers Using SAR Images**
Mohammad A. Fazel[1], Jalal Amini[1], Saeid Homayouni[2]
[1]Colleague of Engineering, University of Tehran, Iran, [2]Department of Geography, University of Ottawa, Canada

WE4.P B.2 **Monitoring of Ground Deformation in Beijing Using SBAS-DInSAR Technique**
Gang Liu, Robert Wang, Yun Kai Deng, Runpu Chen, YunFeng Shao, Wei Xu, Dengjun Xiao
Department of Space Microwave Remote Sensing System, Institute of Electronics, Chinese Academy of Sciences, China

WE4.P B.3 **Change Detection Methods in High Resolution Cosmo SkyMed Images**
Sofia Lanfri[1], Marcelo Scavuzzo[1], Mario A. Lanfri[1], Gabriela Palacio[2], Alejandro C. Frery[3]
[1]Instituto Mario Gulich, Comisión Nacional de Actividades Espaciales, Argentina, [2]Universidad Nacional de Río Cuarto, Argentina, [3]Universidade Federal de Alagoas, Brazil

WE4.P B.4 **The Application of InSAR Time Series for Landcover Classification**
Hye Won Yun, Jung Rack Kim, Choi Yun Soo, Ha Su Yoon
Department of Geoinformatics, University of Seoul, Korea

WE4.P B.5 **Classification of High-Resolution SAR Imagery by Random Forest Classifier**
Xi Ye[1,2], Hong Zhang[1], Chao Wang[1], Fan Wu[1], Bo Zhang[1], Yixian Tang[1]
[1]Key Laboratory of Digital Earth Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China, [2]College of Computing & Communication Engineering, University of Chinese Academy of Sciences, China

WE4.P B.6 **An Improved Regional Integration Method Based on Size-constrain Region Merging**
Fengyuan Zhen[1,2], Ling Fan[1], Chao Wang[2]
[1]School of Science, Beijing Jiaotong University, China, [2]Key Laboratory of Digital Earth Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China

WE4.P B.8 **Detection of Water-logging in a Large Number of Paddy Fields**
Naoki Ishitsuka
Ecosystem Informatics Division, National Institute for Agro-Environmental Sciences, Japan

WE4.P B.9 **Automated Method for Tracing Shorelines in L-band SAR Images**
Tomohito Asaka[1], Yoshiyuki Yamamoto[2], Sadayoshi Aoyama[1], Keishi Iwashita[1], Katsuteru Kudou[1]
[1]College of Industrial Technology, Nihon University, Japan, [2]Department of Urban Environment, Faculty of Engineering, Aichi Institute of Technology, Japan

WE4.P B.10 **Non Supervised Method for Low-Backscattering Area Extraction in High Resolution SAR Image**
Long Zhao[1,2], Hong Zhang[1], Fan Ling[2], Chao Wang[1]
[1]Key Laboratory of Digital Earth Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China, [2]School of Science, Beijing Jiaotong University, China

C. Advances in Analysis Techniques

WE4.P C.1 **Effect of AD Converter Saturation on SAR System Performance**
Zhou Li, Chunsheng Li, Ze Yu, Yan Wang
School of Electronics and Information Engineering, BeiHang University, China

WE4.P C.2 **An Advanced InSAR Algorithm for Surface Deformation Monitoring: SqueeSAR™**
Shigeki Kuzuoka[1], Alessandro Ferretti[2], Fabrizio Novali[2]
[1]Satellite Business Network, Japan, [2]Tele-Rilevamento Europa (T.R.E.), Italy

WE4.P C.3 **Method to Obtain Phase Continuous ScanSAR Interferogram**
Yoshikuni Shindo, Shino Ogino, Yoshiaki Watanabe, Yoshifumi Kawatani, Atsushi Yoshida, Takeshi Nishimura
Mitsubishi Space Software Co.,Ltd., Japan

WE4.P C.4 **Scene Classification from PolSAR Image Using Medium-level Features**
Yongfeng Cao, Junying Ren, Caixia Su, Jianjuan Liang
School of Mathematics and Computer Science, Guizhou Normal University, China

WE4.P C.5 **Comparison of Model-Based Polarimetric Decomposition Algorithms**
Daisuke Sato, Takuma Watanabe, Hiroyoshi Yamada, Yoshio Yamaguchi
Graduate School of Science & Technology, Niigata University, Japan

WE4.P C.6 **A Qualitative Analysis of Backscattered Radar Waves from the Lunar Surface**
Arnab Muhuri, Swinky Dhingra, Avik Bhattacharya, Gopalan Venkataraman
Centre of Studies in Resources Engineering, Indian Institute of Technology Bombay, India

WE4.P C.7 **Coherent Scatterers Characterization Using Time-Frequency Analysis of PolSAR Data**
Canbin Hu[1,2], Siqian Zhang[1], Hai Liu[3], Lingjun Zhao[1], Gangyao Kuang[1]
[1]College of Electronic Science and Engineering, National University of Defense Technology, China, [2]Institute of Electronics and Telecommunications of Rennes, University of Rennes 1, France, [3]Center for Northeast Asian Studies, Tohoku University, Japan

WE4.P C.8 **Comparison of Speckle Filtering Methods for POLSAR Analysis of Earthquake Damaged Areas**
Kazutomo Yamamoto, Yoshio Yamaguchi, Sang-Eun Park, Yi Cui, Hiroyoshi Yamada
Niigata University, Japan

WE4.P C.9 **Experimental Evaluations of Polarimetric Observation for Bistatic Radar Using GPS Reflected Signals**
Hikaru Egawa[1], Hirobumi Saito[2], Seisuke Fukuda[2]
[1]School of Engineering, University of Tokyo, Japan, [2]Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency (JAXA), Japan

D. SAR Signal Processing

WE4.P D.1 **Study on Orbit Determination Precision for High Resolution Spaceborne SAR**
Yujing Liu, Chunsheng Li, Na Pu, Ze Yu, Haojie Zhang
School of Electronics and Information Engineering, BeiHang University, China

WE4.P D.2 **An Efficient Algorithm for Single-/ Multi-channel SAR Superresolution Imaging of Large Scenes**
Zenghui Li, Junjun Yin, Jian Yang
Department of Electronic Engineering of Tsinghua University, China

WE4.P D.3 **A New Fast Back-Projection Algorithm Using Polar Format Algorithm**
Ze-Min Yang, Guang-Cai Sun, Meng-Dao Xing
The State Key Lab for Radar Signal Processing, Xidian University, China

WE4.P D.4 **A New Local Feature Extraction in SAR Image**
Tao Tang[1], Deliang Xiang[1], Hai Liu[2], Yi Su[1]
[1]College of Electronic Science & Engineering, National University of Defense Technology, China, [2]Center for Northeast Asian Studies, Tohoku University, Japan

WE4.P D.5 **A Method of Global Optimization Tracking for Airborne Wide Area Surveillance Systems**
Kun Wu[1,2], Fengjun Zhao[2], Shichao Zheng[1,2], Wei Xu[2], Robert Wang[2]
[1]Space Microwave Remote Sensing System Department, Institute of Electronics, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

WE4.P D.6 **New Applications of Parameter-Adjusting Polar Format Algorithm in Spotlight Forward-Looking Bistatic SAR Processing**
Hairong Zhang, Yan Wang, Jingwen Li
School of Electronic and Information Engineering, Beihang University, China

WE4.P D.7 **On Compressed Sensing Applied to 2-D SAR Imaging**
Peng Xiao, Ze Yu, Chunsheng Li, Yan Wang
School of Electronics and Information Engineering, BeiHang University, China

WE4.P D.8 **Study on Motion Compensation for Airborne Forward Looking Array SAR by Time Division Multiplexing Receiving**
Zhang Ying-jie[1,2], Han Kuo-ye[1,2], Wang Yan-ping[1], Tan Wei-Xian[1], Hong Wen[1]
[1]National Key Laboratory of Science and Technology on Microwave Imaging, Institute of Electronics, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

WE4.P D.9 **High Resolution Spaceborne SAR Imaging Algorithm Using Chaotic FM Signals**
Yufeng Li[1], Zhongma Cui[2], Ze Yu[1], Haojie Zhang[1]
[1]School of Electronics and Information Engineering, Beihang University, China, [2]Institue No.25 of the Second Academy, China Aerospace Science & Industry Crop, China

E. SAR Systems and Sensors

WE4.P E.1 **MIMO SAR-Based Wide-Swath Remote Sensing**
Wen-Qin Wang, Huaizong Shao, Jingye Cai
School of Communication and Information Engineering, University of Electronic Science and Technology of China, China

WE4.P E.2 **Diversity Schemes Analysis for MIMO Synthetic Aperture Radar**
Kuoye Han[1,2], Yanping Wang[2], Yingjie Zhang[1,2], Weixian Tan[2], Wen Hong[2]
[1]University of Chinese Academy of Sciences, China, [2]Institute of Electronics, the Chinese Academy of Sciences, China

WE4.P E.3 **Multi-Pass Stepped Frequency Imaging of Geosynchronous SAR**
Zhiqian Wang, Chunsheng Li, Ze Yu, Yan Wang
School of Electronics and Information Engineering, BeiHang University, China

WE4.P E.4 **Signal Processing of Arc FMCW SAR**
Yunhua Luo, Hongjun Song, Robert Wang, Zheng Xu, Yongli Li
Department of Space Microwave Remote Sensing System, Institute of Electronics, Chinese Academy of Sciences, China

WE4.P E.5 **Improving the Azimuth Resolution Based on Ground Based Spotlight SAR**
Zhang Jun, Tong Yongmu, Wang Yaxin, Zhang Jianmin
Electronic Department, Tianjin University of Technology and Education, China

WE4.P E.6 **The Novel FastGBSAR Sensor: Deformation Monitoring for Dike Failure Prediction**
Sabine Roedelsperger, Alex Coccia, Daniel Vicente, Christian Trampuz, Adriano Meta
MetaSensing BV, The Netherlands

WE4.P E.7 **An Experimental Ground-based SAR System for Studying SAR Fundamentals**
Viet T. Vu, Dheeraj N. Nehru, Mats I. Pettersson, Thomas K. Sjögren
Department of Electrical Engineering, Blekinge Institute of Technology, Sweden

F. Radar Technology

WE4.P F.1 **The Development and Performance of Chirp Pulse Generator and Processor for Pi-SAR-L2**
Isamu Oihara, Takashi Fujimura, Hideharu Tozuka, Tsunekazu Kimura
NEC Corporation, Japan

WE4.P F.2 **Review and Forecast of Quantum Radar**
Peng Lin, Ze Yu, Chunsheng Li
School of Electronic and Information Engineering, Beihang University, China

WE4.P F.3 **Sparse Imaging Using Improved OMP Technique in FD-MIMO Radar for Target off the Grid**
Tianyun Wang, Changchang Liu, Li Ding, Hongchao Lu, Weidong Chen
Department of Electronic Engineering and Information Science, University of Science and Technology of China, China

Session Timetable

Thursday (Sept. 26)

8:40–10:20 Room 1 (201A)

TH1.R1: [Special Session] SAR Application - Natural Disaster Monitoring I

Co-Chairs: **Toshifumi Moriyama** *(Nagasaki University)*, **Takashi Nonaka** *(PASCO)*

TH1.R1.1 8:40 **Spaceborne SAR Data Analysis for Marine Debris after the Great East Japan Earthquake**
Yoshifumi Aoki, Motofumi Arii, Masakazu Koiwa
Mitsubishi Space Software Co.,Ltd., Japan

TH1.R1.2 9:00 **Mapping Displacement around Tokyo International Airport after The Great East Japan Earthquake 2011 Derived from TerraSAR-X Imageries**
Takashi Nonaka, Toshifumi Hiramatsu
Satellite Business Division, PASCO CORPORATION, Japan

TH1.R1.3 9:20 **Damage Detection after Earthquake by an X-band High Resolution Airborne SAR**
Tatsuharu Kobayashi, Toshihiko Umehara, Jyunpei Uemoto, Makoto Satake, Shoichiro Kojima,Takeshi Matsuoka, Akitsugu Nadai, Seiho Uratsuka
Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology, Japan

TH1.R1.4 9:40 **Mathematical Morphology Approach to the Detection of the off the Pacific Coast of Tohoku Japan Tsunami Reached Farmland from PALSAR Data**
Yasuharu Yamada
National Institute for Rural Engineering, National Agriculture and Food Research Organization, Japan

TH1.R1.5 10:00 **Detection of Damaged Area by Polarimetric SAR**
Motoyuki Sato, Si-Wei Chen
Center for Northeast Asian Studies, Tohoku University, Japan

8:40–9:40 Room 2 (201B)

TH1.R2: Application - Ocean

Co-Chairs: **Jian Yang** *(Tsinghua University)*, **Akitsugu Nadai** *(NICT)*

TH1.R2.1 8:40 **Dual Co-polarized SAR Imaging of the Ocean Surface Phenomena**
Alexander Myasoedov[1], Vladimir Kudryavtsev[1], Bertrand Chapron[1,2]
[1]Satellite Oceanography Laboratory, RSHU, Russia, [2]Laboratoire d'Ocanographie Spatiale, IFREMER, France

TH1.R2.2 9:00 **Evaluation of Wave Height Retrieval Algorithm for Ocean SAR Image by Using Numerical Simulation**
Takero Yoshida, Chang-Kyu Rheem
Institute of Industrious Science, The University of Tokyo, Japan

TH1.R2.3 9:20 **A New Ship Detector for ScanSAR Imagery**
Ziwei Wang[1,2], Chao Wang[1], Hong Zhang[1], Fan Wu[1], Bo Zhang[1], Yixian Tang[1]
[1]Key Laboratory of Digital Earth Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

Session Timetable

8:40–10:20 Room 3 (202A)

TH1.R3: SAR/ISAR Signal Processing I

Chair: **Hiroshi Kimura** *(Gifu University)*

TH1.R3.1 8:40
Modification of Super-spatially Variant Apodization (super-SVA) for Sidelobe Reduction
Seung-Phil Lee[1], S. B. Kim[2], J. C. Woo[3], S. M. Lee[1], J. E. Kim[1], Young-Soo Kim[1]
[1]Department of Electrical Engineering, Pohang University of Science and Technology (POSTECH), Korea, [2]Digitron Co., Ltd., Korea, [3]ISR R&D Lab, LIG Nex1 Co., Ltd., Korea

TH1.R3.2 9:00
Processing High Squint FMCW SAR Data Using Extended Inverse Chirp-Z Transform Algorithm
Yue Liu, Robert Wang, Yunkai Deng, Fengjun Zhao, Zhimin Zhang
Spaceborne Microwave Remote Sensing System Department, Institute of Electronics, Chinese Academy of Sciences, China

TH1.R3.3 9:20
Segmented BAQ Algorithm for SAR Raw Data of Strong Target in Weak Background
Haojie Zhang, Jie Chen, Jingwen Li, Hongcheng Zeng, Wei Yang
School of Electronic and Information Engineering, Beihang University, China

TH1.R3.4 9:40
Effects of Centre-beam Approximation on Airborne Repeat-pass Interferometric SAR
Yin-wei Li[1,2], Mao-sheng Xiang[1], Yan-ping Wang[1]
[1]National Key Laboratory of Science and Technology on Microwave Imaging, Institute of Electronics, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

TH1.R3.5 10:00
Nonstationary Image Noise Removal (NINR)
Fatih Porikli[1], Akshay Soni[2], Kei Suwa[3]
[1]Mitsubishi Electric Research Labs, USA, [2]University of Minnesota, USA, [3]Mitsubishi Electric Corporation, Japan

Session Timetable

10:40–12:20 Room 1 (201A)

TH2.R1: [Special Session] SAR Application - Natural Disaster Monitoring II

Co-Chairs: **Toshifumi Moriyama** *(Nagasaki University)*, **Takashi Nonaka** *(PASCO)*

TH2.R1.1 10:40 **Building Damage Estimation by Integration Between Seismic Intensity Information and ALOS/PALSAR Images of the 2007 Peru Earthquake**
Masashi Matsuoka[1], Miguel Estrada[2]
[1]Department of Built Environment, Tokyo Institute of Technology, Japan, [2]Japan-Peru Center for Earthquake Engineering and Disaster Mitigation (CISMID), National University of Engineering, Peru

TH2.R1.2 11:00 **Ground Deformation Related to Active Faults Detected by Persistent Scatterer InSAR**
Manabu Hashimoto
Disaster Prevention Research Institute, Kyoto University, Japan

TH2.R1.3 11:20 **Case Study of Landslides Recognition Using Dual/Quad Polarization Data of ALOS/PALSAR**
Ryoichi Furuta[1], Kazuhide Sawada[2]
[1]Research & Development Department, Remote Sensing Technology Center of Japan, Japan, [2]River Basin Research Center, Gifu University, Japan

TH2.R1.4 11:40 **Trial of Volcanic Ash Detection Using Pi-SAR-L2**
Manabu Watanabe[1], Noriyuki Kawano[2], Tadanori Ishizuka[3], Yukinori Nowa[3], Takeshi Shimizu[3], Masanobu Shimada[1]
[1]EORC, JAXA, Japan, [2]German Aerospace Center (DLR), Germany, [3]Erosion and Sediment Control Research Group, Public Works Research Institute, Japan

TH2.R1.5 12:00 **Volcanic Monitoring by Polarimetric and Interferometric Airborne SAR (Pi-SAR2)**
Tatsuharu Kobayashi, Toshihiko Umehara, Jyunpei Uemoto, Makoto Satake, Shoichiro Kojima,Takeshi Matsuoka, Akitsugu Nadai, Seiho Uratsuka
Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology, Japan

10:40–12:00 Room 2 (201B)

TH2.R2: Application - Land Use / Land Cover

Chair: **Masato Ohki** *(JAXA)*

TH2.R2.1 10:40 **A Case Study of Land Cover Classification Using Combined PolSAR and Optical**
Takeo Tadono[1], Atsuko Nonomura[2], Hitoshi Moriya[2]
[1]Earth Observation Research Center, Japan Aerospace Exploration Agency, Japan, [2]Faculty of Engineering, Kagawa University, Japan

TH2.R2.2 11:00 **Evaluation of PolInSAR Classification by ALOS/PALSAR**
Masato Ohki, Masanobu Shimada
Earth Observation Research Center, Japan Aerospace Exploration Agency, Japan

TH2.R2.3 11:20 **Classification of RISAT-1 Hybrid Polarimetric Data for Various Land Features**
Varsha Turkar[1], Shaunak De[1], G. G. Ponnurangam[1], Rinki Deo[1], Y. S. Rao[1], Anup Das[2]
[1]CSRE, Indian Institute of Technology – Bombay, India, [2]Space Application Center, ISRO, India

TH2.R2.4 11:40 **Experiment on Human and Vehicle Detection Using Pi-SAR2**
Takashi Fujimura[1], Kiyonobu Ono[1], Hidefumi Nagata[1], Hideharu Tozuka[1], Tsunekazu Kimura[1], Minoru Murata[1], Tomoko Ishii[2], Yoshitaka Oura[2], Masanori Miyawaki[2]
[1]NEC Corporation, Japan, [2]NEC Aerospace Systems, Ltd., Japan

Session Timetable

10:40–12:00 Room 3 (202A)

TH2.R3: SAR/ISAR Signal Processing II

Chair: **Shohei Kidera** *(University of Electro-Communications)*

TH2.R3.1 10:40 **ALOS PALSAR Tomography: An Experiment in Suburban Environment**
Hiroshi Kimura
Department of Electrical, Electronic and Computer Engineering, Gifu University, Japan

TH2.R3.2 11:00 **An Evaluation on Moving Target Parameter Estimation Using Synthetic Aperture Radar Systems**
Mats I. Pettersson, Thomas K. Sjögren, Viet Vu
Department of Electrical Engineering, Blekinge Institute of Technology, Sweden

TH2.R3.3 11:20 **Bistatic ISAR Signal Modelling and Image Analysis**
Shougang Chai, Weidong Chen
Department of Electronic Engineering and Information Science, University of Science and Technology of China, China

TH2.R3.4 11:40 **A Novel MISO-ISAR for Moving Airborne Target**
Shougang Chai, Weidong Chen
Department of Electronic Engineering and Information Science, University of Science and Technology of China, China

10:40–12:20 Room 4 (202B)

TH2.R4: Advanced and Innovative SAR Concepts and Ground Based Systems

Chair: **Masahiko Nishimoto** *(Kumamoto University)*

TH2.R4.1 10:40 **FPGA Based Architecture for Real-time SAR Processing with Integrated Motion Compensation**
M. Pfitzner, F. Cholewa, P. Pirsch, H. Blume
Institute of Microelectronic Systems (IMS), Leibniz University Hannover, Germany

TH2.R4.2 11:00 **High Resolution Scan Mode SAR Using Compressive Sensing**
Dehong Liu, Petros T. Boufounos
Mitsubishi Electric Research Laboratories, USA

TH2.R4.3 11:20 **Long-term Landslide Monitoring by GB-SAR Interferometry in Kurihara, Japan**
Masayoshi Matsumoto[1], Kazunori Takahashi[2], Motoyuki Sato[2]
[1]Graduate School of Environmental Studies, Tohoku University, Japan, [2]Center for Northeast Asian Studies, Tohoku University, Japan

TH2.R4.4 11:40 **Effects of Satellite Attitude Jitter on Spaceborne Multichannel SAR Image Qualities**
Jian Zhou, Chunsheng Li, Wei Yang, Jie Chen
School of Electronic and Engineering, Beihang University, China

TH2.R4.5 12:00 **Development of a Ground-based Synthetic Aperture Radar for Land Deformation Monitoring**
Koo Voon-Chet[1], Helmut Essen[2], Josaphat Tetuko Sri Sumantyo[3], Lim Tien-Sze[1], Chan Yee-Kit[1], Habibah Lateh[4]
[1]Centre for Remote Sensing and Surveillance Technologies, Multimedia University, Malaysia, [2]Maxonic GmbH, Germany, [3]Center for Environmental Remote Sensing, Chiba University, Japan, [4]School of Distance Education, Universiti Sains Malaysia, Malaysia

Session Timetable

13:40–15:20 Room 1 (201A)

TH3.R1: Contribution of SAR Remote Sensing on the Great East Japan Earthquake

Chair: **Motoyuki Sato** *(Tohoku University)*

TH3.R1.1 13:40 **The 2011 Tohoku Earthquake and the Related Disasters Observed by InSAR Using ALOS/PALSAR: Mainshock, Induced Inland Earthquakes, and Liquefaction**
Tomokazu Kobayashi
Geospatial Information Authority of Japan, Japan

TH3.R1.2 14:00 **Detection of Crustal Movements Due to the 11 April 2011 Fukushima Earthquake from SAR Images**
Wen Liu[1], Fumio Yamazaki[2], Masashi Matsuoka[1], Takashi Nonaka[3], Tadashi Sasagawa[3]
[1]Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, Japan, [2]Graduate School of Engineering, Chiba University, Japan, [3]Satellite Business Division, PASCO Corporation, Japan

TH3.R1.3 14:20 **Detection of Soil Liquefaction Areas in the Kantou Region Using Multi-temporal InSAR Coherence**
Masayuki Tamura, Weiping Li
Department of Civil and Earth Resources Engineering, Kyoto University, Japan

TH3.R1.4 14:40 **Monitoring of Displacement on a Landslide Slope by GB-SAR Interferometry**
Kazunori Takahashi[1], Masayoshi Matsumoto[2], Motoyuki Sato[1]
[1]Center for Northeast Asian Studies, Tohoku University, Japan, [2]Graduate School of Environmental Studies, Tohoku University, Japan

TH3.R1.5 15:00 **Simplified Algorithm for Detecting Oriented Man-made Objects Using Correlation Coefficients in Circular Polarization Basis**
Ryoichi Sato[1], Hanae Sano[1], Yoshio Yamaguchi[2], Hiroyoshi Yamada[2], Sang-Eun Park[2]
[1]Faculty of Education, Niigata University, Japan, [2]Graduate School of Science and Technology, Niigata University, Japan

13:40–15:20 Room 2 (201B)

TH3.R2: POL and POLInSAR

Co-chairs: **Yoshio Yamaguchi** *(Niigata University)*, **Marco Lavalle** *(Jet Propulsion Laboratory)*

TH3.R2.1 13:40 **Unique Decomposition of a POLSAR Coherency Matrix Using a Generalized Scattering Model**
Shunichi Kusano[1], Kazunori Takahashi[2], Motoyuki Sato[2]
[1]Graduate School of Environmental Studies, Tohoku University, Japan, [2]Center for Northeast Asian Studies, Tohoku University, Japan

TH3.R2.2 14:00 **Experimental Study on Radar Backscatterer from a Simplified Forest Model**
Takuma Watanabe[1], Hiroyoshi Yamada[1], Motofumi Arii[2], Ryoichi Sato[1], Sang-Eun Park[1], Yoshio Yamaguchi [1]
[1]Graduate School of Science and Technology, Niigata University, Japan, [2]Mitsubishi Space Software Co., Ltd., Japan

TH3.R2.3 14:20 **Maritime Application Using H-α Decomposition in Compact and Dual-Pol SAR**
Lei Xie[1,2], Hong Zhang[1], Chao Wang[1], Fan Wu[1], Bo Zhang[1], Yixian Tang[1]
[1]Key Laboratory of Digital Earth Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

TH3.R2.4 14:40 **Reduction of Polarization Parameters of Measured Coherency Matrix by Unitary Transformations**
Ning Cao, Lamei Zhang, Bin Zou
School of Electronics and Information Technology, Harbin Institute of Technology, China

TH3.R2.5 15:00 **Fast Calculation of Adaptive-Non-Negative-Eigenvalue-Decomposition Employing Particle Swarm Optimization**
Toshifumi Moriyama
Graduate School of Engineering, Nagasaki University, Japan

Session Timetable

13:40–15:20 Room 3 (202A)

TH3.R3: SAR/GMTI/STAP and Change Detection
Chair: **Kei Suwa** *(Mitsubishi Electric Corporation)*

TH3.R3.1 13:40 **Parameter Estimation in SAR Imagery Using Stochastic Distances**
Julia Cassetti[1], Juliana Gambini[2], Alejandro C. Frery[3]
[1]Instituto de Desarrollo Humano-Universidad Nacional de Gral. Sarmiento, Argentina, [2]Depto. de Ingeniería Informática-Instituto Tecnológico de Buenos Aires, Argentina, [3]LaCCAN – Laboratório de Computação Científica e Análise Numérica, Universidade Federal de Alagoas, Brazil

TH3.R3.2 14:00 **An Experimental Study on Image Based Multi-Channel SAR-GMTI Algorithm**
Kei Suwa[1], Kazuhiko Yamamoto[1], Masayoshi Tsuchida[1], Toshio Wakayama[1], Shohei Nakamura[2], Jun Endo[2], Kei Hayashi[2], Hideki Hasegawa[2], Yosuke Nakano[2]
[1]Mitsubishi Electric Corporation, Information Technology R & D Center, Japan, [2]Mitsubishi Electric Corporation, Kamakura Works, Japan

TH3.R3.3 14:20 **Forest Clutter Suppression for Moving Target Detection in UHF Dual Channel SAR**
Thomas K. Sjögren[1,2], Viet T. Vu[2], Mats I. Pettersson[2], Daniel Murdin[3], Anders Gustavsson[1], Lars M.H. Ulander[1], Feng Wang
[1]Sensor and Electronic Warfare Systems, Swedish Defence Research Agency (FOI), Sweden, [2]Department of Electrical Engineering, Blekinge Institute of Technology (BTH), Sweden, [3]Research and Development, Nira Dynamics, Sweden

TH3.R3.4 14:40 **Slightly Moved Vehicle Detection with Coherent Change Detection on X-band High Resolution SAR Imagery**
Takehiro Hoshino, Kei Suwa, Noboru Oishi, Toshio Wakayama
Mitsubishi Electric Corporation, Information Technology R&D Center, Japan

TH3.R3.5 15:00 **Evaluation of the Ship Detection by Dual Polarimetric Along-Track Interferometry**
Shoichiro Kojima
Applied Electromagnefic Research Center, National Institute of Information and Communications Technology, Japan

13:40–15:20 Room 4 (202B)

TH3.R4: Advanced Information Extraction Techniques
Chair: **Sang-Eun Park** *(Niigata University)*

TH3.R4.1 13:40 **PolSAR Land Classification by Using Quaternion-Valued Neural Networks**
Fang Shang, Akira Hirose
Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan

TH3.R4.2 14:00 **New Method for Symmetric Target Scattering Characterization in Polarimetric SAR Images**
Junjun Yin, Jian Yang
Department of Electronic Engineering, Tsinghua University, China

TH3.R4.3 14:20 **Efficient Automatic Target Recognition Method for Aircraft SAR Image Using Supervised SOM Clustering**
Shouhei Ohno, Shouhei Kidera, Tetsuo Kirimoto
Graduate School of Informatics and Engineering, University of Electro-Communications, Japan

TH3.R4.4 14:40 **Sparse Imaging Using Modified 2-D Matrix Pencil Method in FD-MIMO Radar**
Tianyun Wang[1], Changchang Liu[1], Weidong Chen[1], Zhiqiang Song[2], Jing Jiang[2]
[1]Department of EEIS, University of Science and Technology of China, China, [2]China Satellite Maritime Tracking and Controlling Department, China

TH3.R4.5 15:00 **Contrast Measures Based on the Complex Correlation Coefficient for PolSAR Imagery**
Alejandro C. Frery[1], Renato J. Cintra[2], Abraão D. C. Nascimento[3]
[1]LaCCAN – Laboratório de Computação Científica e Análise Numérica, Universidade Federal de Alagoas, Brazil, [2]Departamento de Estatística, Universidade Federal de Pernambuco, Brazil, [3]Departamento de Estatística, Universidade Federal de Paraíba, Brazil

Registration Information

	Category	On-site Rate after June 29, 2013
Conference registration	IEEE or IEICE Member *)	JPY 50,000
	Non-member	JPY 60,000
	IEEE or IEICE Student Member **)	JPY 30,000
	Student Non-member **)	JPY 35,000

All payments must be made in Japanese Yen.
*Members of concerned academic societies (IEEE and IEICE) are required to show their membership ID card at registration desk on-site.
**Students are required to their student ID card at registration desk on-site.

Registration Fee includes
One program book, proceedings in a USB, traditional social events as well as refreshments during conference breaks.

Additional Cost for Multiple-Paper Presentation
If a presenter is going to present "2 or more" papers, he/she should pay additional cost of JPY10,000.- per paper for the second and after.

Registration Desk and Hours
Registration desk will open on the 1st Floor during the following hours:
September 23 (Monday): 13:00-17:30
September 24 (Tuesday): 8:00-17:30
September 25 (Wednesday): 8:00-17:30
September 26 (Thursday): 8:00-15:00

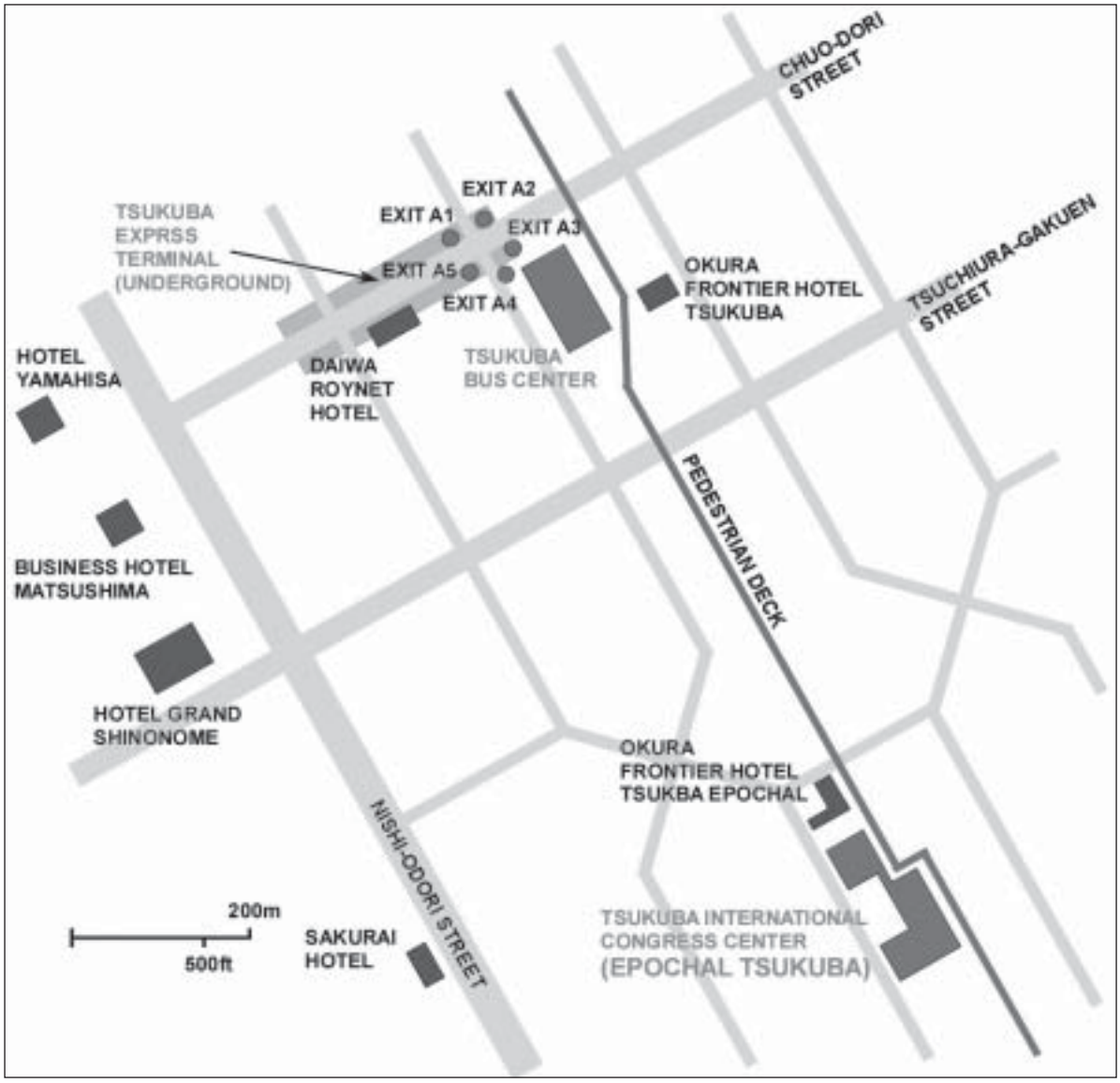
Any inquiries concerning registration should be addressed to:
Registration Office of APSAR2013
c/o ICS Convention Design, Inc.
Chiyoda Bldg., 1-5-18 Sarugaku-cho
Chiyoda-ku, Tokyo 101-8449, Japan
Phone: +81-3-3219-3600
Fax: +81-3-3219-3577
E-mail: apsar2013_reg@ics-inc.co.jp

Venue & Access

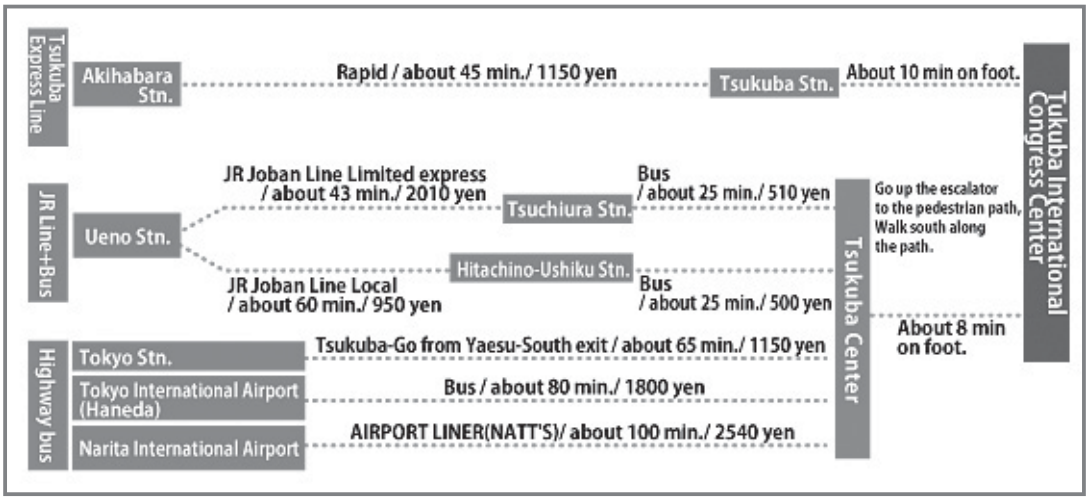
Tsukuba International Congress Center (Epochal Tsukuba)

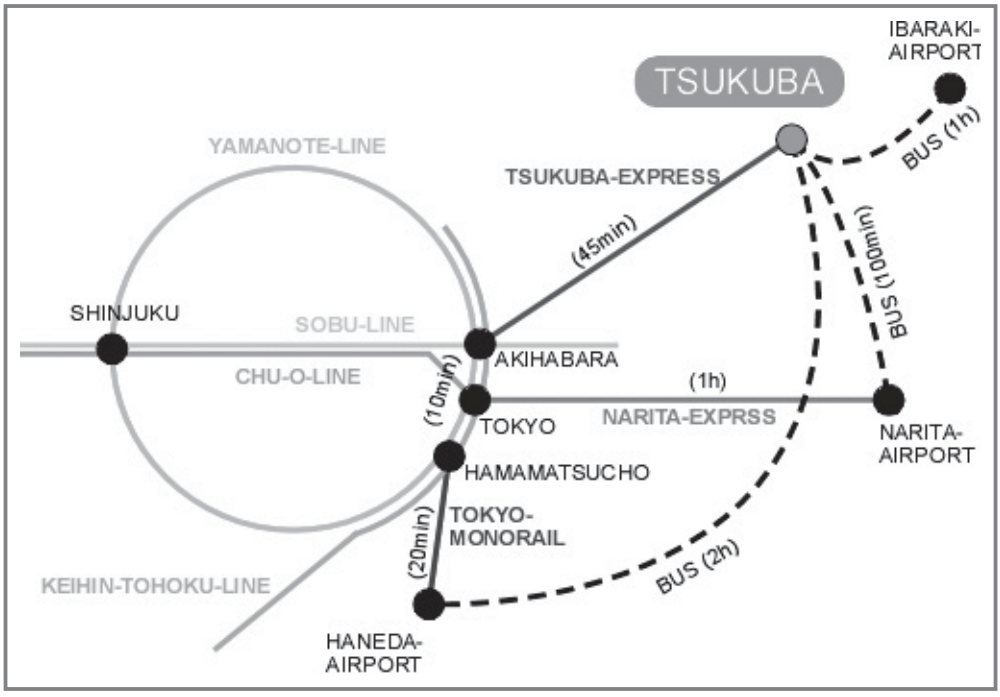
2-20-3, Takezono, Tsukuba, Ibaraki, 305-0032, Japan

Area Map



Transportation Information





Social Events

Welcome Reception

Date & Time Sep. 23 (Mon) 18:00-20:00
Place Restaurant ESPOIR
(1st Floor, Tsukuba International Congress Center)

Banquet

Date & Time Sep. 25 (Wed) 18:00-20:30
Place Conference Room 101&102 (1st Floor)
Entertainment: Kagami-Biraki & Wa-Daiko
Kagami Biraki is a Japanese traditional ceremony which literally translates to "Opening the Mirror". It refers to the opening of a cask of Sake at a party or ceremony.
Taiko means "drum" in Japanese (etymologically "great" or "wide drum"). Outside Japan, the word is often used to refer to any of the various Japanese drums, (“wa-daiko", "Japanese drum", in Japanese). Japanese taiko drums have been developed into a wide range of percussion instruments that are used in both Japanese folk and classical musical traditions.

Technical Tours

OP-1: JAXA Tsukuba Space Center & Tsukuba Tour

Date Sep. 27 (Fri.)
Fare JPY10,500 per person
Course EPOCHAL TSUKUBA 9:00 = JAXA Tsukuba Space Center = Lunch = TSUKUBASAN Cable Car & Ropeway = Inaba Sake Brewery = 19:15 EPOCHAL TSUKUBA
Guide English-speaking guide service is included
Meals 1 Lunch
Transportation Bus
*) Minimum number of participants necessary for the tour 30 persons
*) JAXA Tsukuba Space Center <<Your ID (e.g., passport) is required for participation>>

OP-2: JAXA Tsukuba Space Center [Half Day Tour]

Date Sep. 27 (Fri.)
Fare JPY3,500 per person.
Course EPOCHAL TSUKUBA 9:00 = JAXA Tsukuba Space Center =12:00 Tsukuba Station.
Guide English-speaking guide service is available only at JAXA.
Meals No meal
Transportation Bus
*) Minimum number of participants necessary for the tour 25 persons
*) JAXA Tsukuba Space Center <<Your ID (e.g., passport) is required for participation>>

OP-3: ASAKUSA, Tokyo 1 Day Tour

Date Sep. 27 (Fri.)
Fare JPY10,500 per person
Course EPOCHAL TSUKUBA 9:00 = Brand New Sightseeing Spots = Lunch = ASAKUSA (Senso-ji, Nakamise-Dori) = Edo-Tokyo Museum = 19:15 EPOCHAL TSUKUBA
Guide English-speaking guide service is included
Meals 1 Lunch
Transportation Bus
*) Minimum number of participants necessary for the tour 30 persons

JTB Global Marketing & Travel Inc. (JTB GMT), appointed the official travel agent for APSAR 2013, will handle and operate the tours. Online application form will be available in May 2013. For further details, please visit http://www.apsar2013.org/tour.html .

INQUIRY DESK:
JTB Global Marketing & Travel Inc., Convention Center (CD100720-618)
2-3-11 Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-8604, Japan
Phone: +81-3-5796-5445 E-mail: apsar2013@gmt.jtb.jp

General Information

Weather

The average highest temperature in a day in Tsukuba is around 26 °C and the lowest is around 18 °C in September.

Lunch

The detail is announced on site.

Electricity

Electric power supply is 100V/50Hz in Eastern Japan including Tsukuba and Tokyo. Japanese power outlets are physically identical to 2-flat-pin North American outlets (Type A). Some North American devices will work fine in Japan without plug adapter, however, some sensitive devices may not work properly or even get damaged. (Photo: Japanese 2-flat-pin plug (Type A))

Language

Official language of this conference is English.

Internet Connection

Wireless LAN can be used in the Multi-Purpose Hall.

Currency and credit card

Only Japanese Yen is available. The recent exchange rate is about 1 USD for 100 Yen.

Most hotels, large restaurants and shops will accept international credit cards, the most widely recognized being American Express, MasterCard and Visa.

Time Difference

GMT+9 / No daylight savings time

Business Hours

Government office hours are from 09:00 AM to 05:00 PM from Monday through Friday.

Banking business hours, however, are from 09:00 AM to 03:00 PM on weekdays, and close on weekends.

Tipping

Tipping is not necessary in Japan.

Tour Information

Tsukuba Science City, located about 50 km northeast of Tokyo, is home to around 30% of Japan's public research institutions as well as many private research institutes in the surrounding R & D oriented industrial parks. Via the Tsukuba Express Line from Akihabara Station in Tokyo, Tsukuba Science City is about a one-hour trip from Central Tokyo. There are a variety of unique sightseeing spots in Tsukuba Science City:

- **Mt. Tsukuba** (http://www.jnto.go.jp/eng/location/regional/ibaraki/tukuba.html)
  You can see and enjoy a panoramic view of the Kanto Plain from the summit and one of the most historic shrines in Japan, Tsukuba-san Shrine. The summit of the mountain can be reached easily by cable car or ropeway.

- **Tsukuba EXPO Center** (http://www.expocenter.or.jp/?page_id=41)
  A science museum with the world-largest-class planetarium located at the center of Tsukuba, and there visitors can experience the frontier of technology and science.

- **University of Tsukuba** (http://www.tsukuba.ac.jp/english/)
  One of the Japan's oldest and best respected universities with over 130 years history. The University is also well known to have produced three Nobel Prize winning scientists.

- **The Science Museum of Map and Survey** (http://www.gsi.go.jp/ENGLISH/)

- **Tsukuba Botanical Garden** (http://www.tbg.kahaku.go.jp/english/)

- **JAXA Tsukuba Space Center** (http://www.jaxa.jp/index_e.html)

- **Science Square Tsukuba** (http://www.aist.go.jp/aist_e/sst/)

- **Geological museum** (https://www.gsj.jp/Muse/eng/)

View from the summit of Mt. Tsukuba

JAXA Tsukuba Space Center

Authors Index

X

Y

Z