

# *The Third ENRI International Workshop on ATM/CNS (EIWAC2013)*

**- Drafting future sky-**

*Program*

**[Venue]**

**Miraikan, Tokyo, JAPAN**

**[Schedule]**

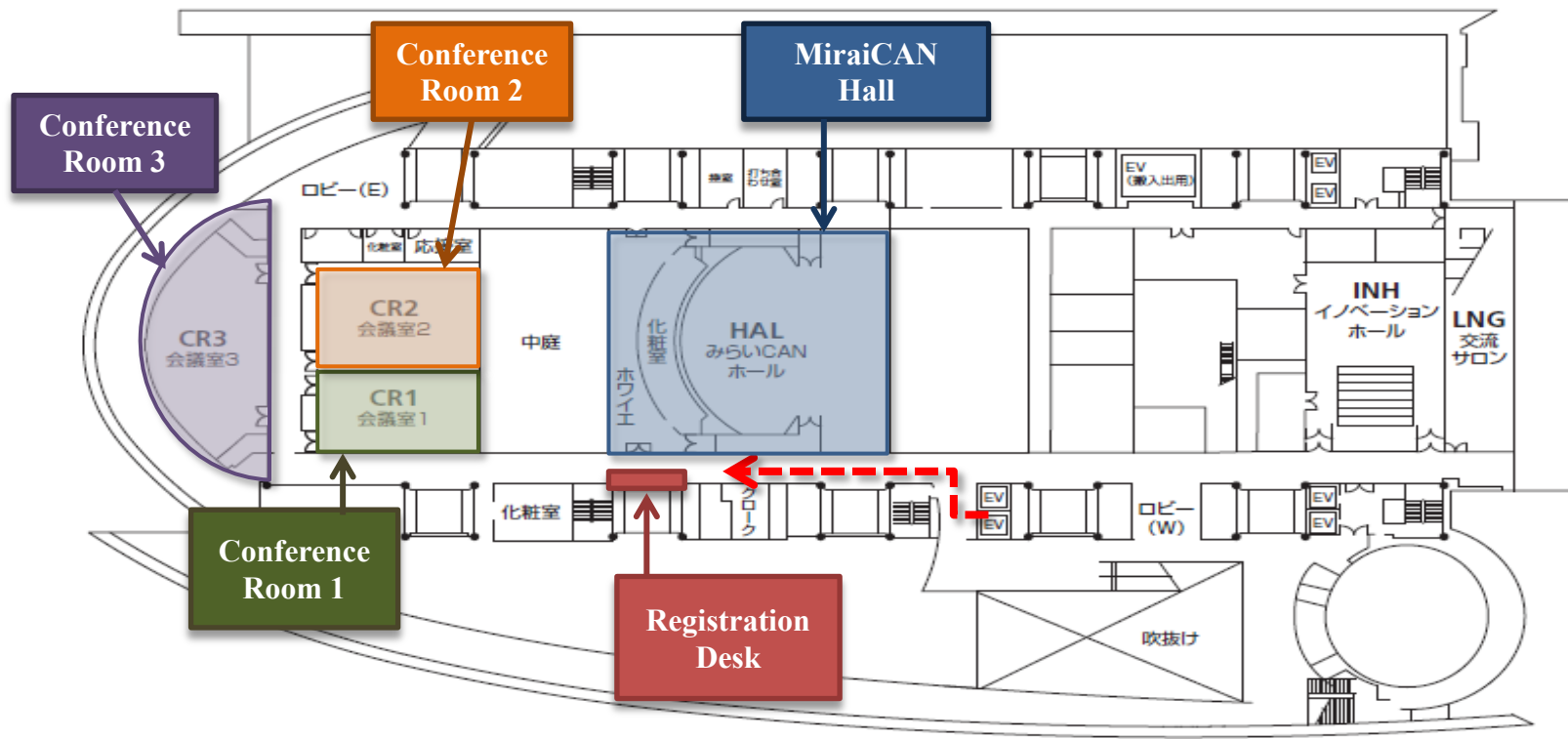
<b>2/19 Plenary Session</b>	<b>10:00~17:30</b>
<b>2/20 Technical Session</b>	<b>10:00~17:30</b>
<b>2/21 Invited Session</b>	<b>10:00~17:00</b>
<b>Technical, Poster &amp; Tutorial Sessions</b>	



# EIWAC2013

February 19-21 2013  
Miraikan, Tokyo, JAPAN

## Miraikan MAP



# Tuesday, 19<sup>th</sup> February

## MiraiCAN Hall

Opening Session -Chair K. Yamamoto, ENRI

**10:00** **Opening Address  
Greetings**

Plenary Session 1 -Chair K. Yamamoto, ENRI

**10:30** [ENS-001] **The ICAO Approach to Global Air Navigation Plan**

+N. Graham,  
*International Civil Aviation Organization*

**11:10** [ENS-002] **Update of the NextGen project**

+M. Reeves,  
*US Federal Aviation Administration, US*

**11:50** [ENS-003] **From SESAR to standardization**

+P. Souchu,  
*Direction des Services de la Navigation Aérienne, France*

**12:30** **Lunch break**

Plenary Session 2 -Chair K. Daiki, ENRI

**13:50** [ENS-004] **JCAB CARATS and ENRI's R&D activities**

+K. Yamamoto,  
*Electronic Navigation Research Institute, Japan*

**14:20** [ENS-005] **Future ATM – from Asian operator's point of view**

+M. Eran-Tasker,  
*Association of Asia Pacific Airlines, Singapore*

**15:00** [ENS-006] **MRJ Features and Navigation Perspective**

+Y. Nakamura,  
*Mitsubishi Aircraft Co.*

**15:30** **Break**

**16:00** Panel Discussion -Chair S. Ozeki, ENRI

**Future ATM: Centralized, decentralized or best mixed?**

Panelists: S. Suzuki, *The University of Tokyo, Japan*

B. Cowles, *IATA*

P. Souchu, *Direction des Services de la Navigation Aérienne, France*

T. Lauderdale, *NASA Ames Research Center, US*

**17:40** **Closing Remarks**

+K. Yamamoto,  
*Electronic Navigation Research Institute, Japan*

## Conference Room 3

**15:00** Exhibition

**Multilateration (MLAT): Optically Connected Multilateration System  
(Optimus)**

*Japan Radio Co., Ltd.*

**WAM (Wide Area Multilateration) Demonstration  
Aviation Solutions**

*NEC Corporation  
NEC Corporation*

**Radio Propagation & Network Simulation, Operations Research**

*Kozo Keikaku Engineering Inc.*

**Photonics-based Millimeter-wave Signal Generation and Its Distribution  
Technology**

*National Institute of Information and Communication Technology*

**Introduction to Airport Security Technologies (R&D)**

*Hitachi, Ltd.*

**Guidelines for Applicants**

*Aeronautical Safety College*

**Products**

*Itochu Aviation Co.*

**Products (MRJ)**

*Mitsubishi Aircraft Co.*

**Ultra-small NIRS Device for Brain Activity Measurement**

*Tohoku University*

**Introduction to CARATS (Long-term Vision)**

*Japan Civil Aviation Bureau*

**Notification of APISAT2013 Conference**

*Japan Society for Aeronautical and Space Sciences*

**Introduction to Long-Term R&D Vision**

*Electronic Navigation Research Institute*

**Mode S Technologies**

*Electronic Navigation Research Institute*

**A Visualization Tool of ATC Tasks: COMPASi**

*Electronic Navigation Research Institute*

**Advanced Radar Technologies**

*Electronic Navigation Research Institute*

**18:00** **Reception** -Chair E. Itoh, ENRI

**20:00** **Close of Reception**

# Wednesday, 20<sup>th</sup> February

## Conference Room 1

Technical Session **CNS Projects** –Chair M. Harigae, JAXA

**10:00** [EN-001] **U. S. Progress in ADS-B Systems Development and Implementation**

<sup>+</sup>D. Arbuckle,  
US Federal Aviation Administration, US  
presented by M. Reeves

**10:30** [EN-027] **Space for safe skies: ESA's Iris Programme of Satellite Communication for Air Traffic Management**

<sup>+</sup>N. Ricard, C. Morlet,  
European Space Agency, Netherland

**11:00** [EN-005] **EU-Japan partnerships under GNSS.Asia with FP7 and Horizon 2020: opportunities in the aviation sector**

<sup>+</sup>F. Mura, T. Ichioka,  
EU-Japan Centre for Industrial Cooperation, Japan  
K. Yajima,  
Lighthouse Technology & Consulting Co.,Ltd., Japan

**11:30** Lunch break

## Conference Room 2

Technical Session **Issues and Resolutions for Future ATM**  
–Chair S. Fukushima, ENRI

**10:00** [EN-008] **A STUDY ON OPERATION CONCEPT FOR NEXT GENERATION AIR VEHICLES IN KOREA**

<sup>+</sup>J-H. Han, Y-C. Hwang,  
The Korea Transport Institute, South Korea

**10:30** [EN-021] **Automated Separation Assurance with Weather and Uncertainty**

<sup>+</sup>T. A. Lauderdale, H. Erzberger,  
NASA Ames Research Center, US

**11:00** [EN-038] **Transitioning Resolution Responsibility between the Controller and Automation Team in Simulated NextGen Separation Assurance**

<sup>†</sup>C. Cabrall, A. Gomez, J. Homola, S. Hunt, L. Martin, J. Mercer,  
San Jose State University, NASA Ames Research Center, US  
T. Prevot,  
NASA Ames Research Center, US

**11:30** Lunch break

## Conference Room 3

**10:00** Exhibition

**MLAT: Optimus** JRC  
**Aviation Solutions** NEC

**Radio Propagation & Network Simulation, Operations Research**

*Kozo Keikaku Engineering Inc.*

**Photonics-based Millimeter-wave Signal Generation and Its Distribution Technology** NICT

**Introduction to Airport Security Technologies (R&D)** Hitachi, Ltd.

**Guidelines for Applicants** Aeronautical Safety College  
**Products** Itochu Aviation Co.

**Products (MRJ)** Mitsubishi Aircraft Corp.  
**Ultra-small NIRS Device for Brain Activity Measurement**

*Tohoku University*

**Introduction to CARATS (Long-term Vision)** JCAB

**Notification of APISAT2013 Conference** JSASS

**Introduction to Long-term R&D Vision** ENRI

**Mode S Technologies** ENRI

**A Visualization Tool of ATC Tasks: COMPASi** ENRI

**Advanced Radar Technologies** ENRI

**Passive Secondary Surveillance Radar** ENRI

**Fatigue and Drowsiness Predictor** ENRI

## Wednesday, 20<sup>th</sup> February

### Conference Room 1

Student Session **CNS Research** -Chair S. Ozeki, ENRI

**13:30** [EN-004] **Joint target tracking and systematic error correction for Wide Area Multilateration**

<sup>†</sup>J. Abbud, G. De Miguel,  
*Universidad Politécnica de Madrid, Spain*

**14:00** [EN-037] **Applying Bayesian Inference to Ephemeris Monitor for GBAS**

<sup>†</sup>R. Yasunaga, T. Yairi,  
*The University of Tokyo, Japan*  
K. Suzuki, K. Iijima,  
*NEC Corporation, Japan*

**14:30** [EN-049] **Assessing the availability of a single-frequency satellite based augmentation system in the Korean region**

<sup>†</sup>E. Bang, Jinsil Lee, Jinyun Lee,  
*Korea Advanced Institute of Science and Technology, Korea*

**15:00 Break**

Organized Session **GNSS and Ionosphere** -Chair S. Saito, ENRI

**15:30** [EN-048] **High-resolution ionospheric total electron content observation using dense GNSS receiver networks**

<sup>†</sup>T. Tsugawa, M. Nishioka, T. Maruyama, T. Nagatsuma, K. T. Murata, M. Ishii,  
*National Institute of Information and Communications Technology, Japan*  
A. Saito,  
*Kyoto University, Japan*  
Y. Otsuka,  
*Nagoya University, Japan*  
S. Saito,  
*Electronic Navigation Research Institute, Japan*

**16:00** [EN-019] **Analytical results of ionospheric delay gradient based on GPS monitoring stations near Suvarnabhumi airport in Thailand**

<sup>†</sup>S. Rungraengwajaike, P. Supnithi,  
*King Mongkut's Institute of Technology Ladkrabang, Thailand*  
S. Saito,  
*Electronic Navigation Research Institute, Japan*  
N. Siansawasdi,  
*Aeronautical Radio of Thailand, Thailand*  
A. Saekow,  
*Stanford International University, Thailand*

**16:30** [EN-018] **Statistical characteristics of background ionospheric total electron content (TEC) in Bangkok, Thailand**

<sup>†</sup>P. Supnithi, S. Rungraengwajaike,  
*King Mongkut's Institute of Technology Ladkrabang, Thailand*  
<sup>†</sup>S. Saito,  
*Electronic Navigation Research Institute, Japan*  
<sup>†</sup>N. Siansawasdi,  
*Aeronautical Radio of Thailand, Thailand*  
A. Saekow,  
*Stanford International University, Thailand*

**17:00** [EN-042] **Flight Trails to collect GPS data under Equatorial Ionospheric Plasma Bubbles**

<sup>†</sup>T. Tsujii, T. Fujiwara, T. Kubota,  
*Japan Aerospace Exploration Agency, Japan*  
S. Saito, T. Yoshihara,  
*Electronic Navigation Research Institute, Japan*

**17:30 Close of Session**

### Conference Room 2

Technical Session **Safety** -Chair M. Fujita, ENRI

**13:00** [EN-003] **New issues raised on collision avoidance by the introduction of remotely piloted aircraft (RPA) in the ATM system**

<sup>†</sup>J.-M. Loscos,  
*Direction des Services de la Navigation Aérienne, France*

**13:30** [EN-012] **Managing Separation of Unmanned Aerial Vehicles Using High-Integrity GNSS Navigation**

<sup>†</sup>S. Pullen,  
*Stanford University, US*

**14:00** [EN-028] **Aviation Infrastructure Risk Assessment: Effect of Communication and Surveillance Facility Service Outages on Traffic Separations**

<sup>†</sup>S. S. Borener,  
*US Federal Aviation Administration, US*  
V. S. Guzhva,  
*MCR, LLC, US*

**14:30** [EN-050] **Toward independent segmented parallel approaches - an initial assessment of collision risks**

<sup>†</sup>C. Hansas,  
*German Aerospace Center DLR, Germany*

**15:00 Break**

Technical Session **Airport Management** -Chair K. Kageyama, ENRI

**15:30** [EN-024] **A Simulation Study on a Method of Departure Taxi Scheduling at Haneda Airport**

<sup>†</sup>I. Yamada, H. Aoyama, M. Brown, M. Sumiya, R. Mori,  
*Electronic Navigation Research Institute, Japan*

**16:00** [EN-035] **Evaluation of an automated taxi concept in a distributed simulation environment**

<sup>†</sup>S. Kocks, T. Rad, T. Feuerle,  
*Technische Universität Braunschweig, Germany*  
A. Oehme,  
*HFC Human-Factors-Consult GmbH, Germany*  
B. Budweg,  
*Diehl Aerospace GmbH, Germany*

**16:30** [EN-026] **Developing key performance indicators for airports**

<sup>†</sup>T. A. Granberg, A. O. Munoz,  
*Linköping University, Sweden*

**17:00 Close of Session**

### Conference Room 3

Exhibition

**MLAT: Optimus** *JRC*  
**Aviation Solutions** *NEC*

**Radio Propagation & Network Simulation, Operations Research**  
*Kozo Keikaku Engineering Inc.*

**Photonics-based Millimeter-wave Signal Generation and Its Distribution Technology** *NICT*

**Introduction to Airport Security Technologies (R&D)** *Hitachi, Ltd.*

**Guidelines for Applicants** *Aeronautical Safety College*

**Products** *Itochu Aviation Co.*

**Products (MRJ)** *Mitsubishi Aircraft Corp.*

**Ultra-small NIRS Device for Brain Activity Measurement** *Tohoku University*

**Introduction to CARATS (Long-term Vision)** *JCAB*

**Notification of APISAT2013 conference** *JSASS*

**Introduction to Long-term R&D Vision** *ENRI*

**Mode S Technologies** *ENRI*

**A Visualization Tool of ATC Tasks: COMPASi** *ENRI*

**Advanced Radar Technologies** *ENRI*

**Passive Secondary Surveillance Radar** *ENRI*

**Fatigue and Drowsiness Predictor** *ENRI*

**17:00 Close of Session**

# Thursday, 21<sup>st</sup> February

## Conference Room 1

Tutorial:

**Mathematic Model for Aircraft Trajectory Design**

**10:00 [EN-023] Mathematical Models for Aircraft Trajectory Design : A Survey.**

<sup>†</sup>D. Delahaye, S. Puechmorel,  
*École Nationale de l'Aviation Civile, France*  
E. Feron, P. Tsiotras,  
*Georgia Institute of Technology, US*

**11:30 Lunch break**

## Conference Room 2

**Invited Session: Perspectives on ATM**

*-Chair K. Yamamoto, ENRI*

**10:00 [ENS-007] Aircraft Operator's ATM Overview**

<sup>†</sup>B. Cowles,  
*International Air Transport Association, Singapore*

**10:30 [ENS-008] Certification & Oversight of Air Navigation Service in EU system**

<sup>†</sup>F. Giraud,  
*Direction Général de l'Aviation Civile, France*

**11:00 [ENS-009] NASA NextGen Operations Research**

<sup>†</sup>A. Sultan,  
*NASA Headquarters, US*

**11:30 Lunch break**

## Conference Room 3

**10:00 Exhibition**

**11:30 Lunch & Poster Session**

**[EN-023] Mathematical Models of Aircraft Trajectory Design: A Survey.**

<sup>†</sup>D. Delahaye, S. Puechmorel,  
*École Nationale de l'Aviation Civile, France*  
E. Feron, P. Tsiotras,  
*Georgia Institute of Technology, US*

**[EN-014] Simulated and Calculated Trajectories Generation**

<sup>†</sup>J. García Sáez,  
*INECO, Spain*

**[EN-010] Layered Air Traffic Management Model**

<sup>†</sup>E. García,  
*CRIDA/Universidad Politécnica de Madrid, Spain*  
F. Saez, R. Arnaldo,  
*Universidad Politécnica de Madrid, Spain*

**[EN-046] Developing Visualisation Techniques of Tasks in Air Traffic Control Work**

<sup>†</sup>T. Sasaki, H. Hirako, K. Yamazaki,  
*Chiba Institute of Technology, Japan*  
H. Aoyama, S. Inoue, Y. Fukuda,  
*Electronic Navigation Research Institute, Japan*

**[EN-039] A Study on Flight Trajectory Estimation by Using GPS Data Measured in Airliner Cabin**

<sup>†</sup>H. Totoki, N. K. Wickramasinghe,  
*Kyushu University, Japan*

**[EN-043] Development of Trajectory Predictor for Simulating Future Trajectory-Based Operation in Japan**

<sup>†</sup>A. Senoguchi, Y. Fukuda, M. Shirakawa, M. Brown,  
*Electronic Navigation Research Institute, Japan*

**[EN-015] Voice over IP for Air Traffic Management ready for development in Europe**

<sup>†</sup>L. Popescu,  
*EUROCONTROL, Belgium*

**[EN-013] Assessing the safety of airport surface operations: A 4D process model**

<sup>†</sup>S. Wilke, A. Majumdar, W. Y. Ochieng,  
*Imperial College London, UK*

**[EN-022] Assessing the Ability of Current Fast Time Simulation Tools to Model Future Trajectory Based Operations**

<sup>†</sup>G. Tobaruela, A. Majumdar,  
*Imperial College London, UK*  
S. Inoue,  
*Electronic Navigation Research Institute, Japan*

**Advanced Multilateration System "OCTPASS"**

<sup>†</sup>Y. Kakubari,  
*Electronic Navigation Research Institute, Japan*

**76GHz millimeter wave radar connected by radio over fiber**

<sup>†</sup>N. Yonemoto,  
*Electronic Navigation Research Institute, Japan*

# Thursday, 21<sup>st</sup> February

## Conference Room 1

Technical Session: **Simulation / ATM Tools** -Chair J-M. Loscos, DSNA

13:00 [EN-047] **Shared Virtual Sky Concept: the interoperability tool for ATM world**

<sup>†</sup>J. Silva,

*Airbus ProSky, France*

13:30 [EN-033] **A Visualization Tool for Analyzing Task Demands in En-route Air Traffic Control**

<sup>†</sup>D. Karikawa, H. Aoyama,

*Electronic Navigation Research Institute, Japan*

M. Takahashi,

*Tohoku University, Japan*

K. Furuta,

*The University of Tokyo, Japan*

M. Kitamura,

*Research Institute for Technology Management Strategy, Japan*

14:00 [EN-016] **Preliminary Design of Procedure/Airspace Efficiency Assessment Tool (PEAT)**

<sup>†</sup>Y. Eun, D. Jeon, E-M. Oh,

*Korea Aerospace Research Institute, Korea*

14:30 [EN-040] **Flight Trajectory Optimization Tool with Dynamic Programming Developed for Future Air Transportation Systems**

<sup>†</sup>A. Harada, Y. Miyamoto, N. K. Wickramasinghe,

*Kyushu University, Japan*

15:00 Break

Organized Session: **Innovative Technology** -Chair N. Yonemoto, ENRI

15:30 [EN-032] **Linear frequency converter and calibration technique for wideband millimeter-wave communication system such as IEEE802.15.3c and/or IEEE802.11ad**

<sup>†</sup>N. Shibagaki, H. Hanyu,

*Hitachi Ltd., Japan*

16:00 [EN-006] **EO-OE converting technologies for 90GHz radio over fiber systems**

<sup>†</sup>T. Umezawa, A. Kanno, K. Inagaki, T. Kawanishi,

*National Institute of Information and Communications Technology, Japan*

A. Kohmura, S. Futatsumori, N. Yonemoto,

*Electronic Navigation Research Institute, Japan*

N. Shibagaki,

*Hitachi Ltd., Japan*

16:30 [EN-044] **Advanced Microwave Photonic Technologies for Millimeter-Wave Radio-over-Fiber Applications in Wireless Communications and Sensing**

<sup>†</sup>A. Stöhr,

*University Duisburg-Essen, Germany*

presented by S. Babel

17:00 Close of Conference

## Conference Room 2

Technical Session: **Information Management** -Chair M. Brown, ENRI

13:00 [EN-030] **Development of Standardized Flight Data in support of Global ATM Harmonization – Flight Information Exchange Model (FIXM)**

<sup>†</sup>M. Tanino, P. Losee,

*US Federal Aviation Administration, US*

13:30 [EN-034] **An integrated operations solution for Gate-to-Gate airline operations**

<sup>†</sup>N. Zimmer, T. Wiesemann, A. Sindlinger, J. Schiefele,

*Jeppesen, Germany*

J. Clark,

*Jeppesen, US*

F. Morales,

*Jeppesen, Canada*

presented by N. Barraci

14:00 [EN-045] **Real-time Wind Uplinks for Prediction of the Arrival Time and Optimization of the Descent Profile**

<sup>†</sup>N. Bienert, H. Fricke,

*Technische Universität Dresden, Germany*

14:30 [EN-052] **Reduced wake vortex separation using weather information**

<sup>†</sup>N. Matayoshi,

*Japan Aerospace Exploration Agency, Japan*

15:00 Break

Technical Session: **Trajectory Modeling and Optimization**

-Chair C. Gwiggner, U. Hamburg

15:30 [EN-029] **Basic Analysis of Winds Aloft Forecast used for En Route Trajectory Prediction**

<sup>†</sup>H. Hirabayashi, Y. Fukuda,

*Electronic Navigation Research Institute, Japan*

16:00 [EN-011] **Probabilistic Conflict Detection in the Presence of Uncertainty**

<sup>†</sup>Y. Matsuno, T. Tsuchiya,

*The University of Tokyo, Japan*

16:30 [EN-041] **A Study on Benefits Gained by Flight Trajectory Optimization for Modern Jet Passenger Aircraft**

<sup>†</sup>N. K. Wickramasinghe, H. Totoki, A. Harada, Y. Miyamoto,

*Kyushu University, Japan*

17:00 Close of Conference

## Conference Room 3

13:00 **Exhibition**

MLAT: Optimus *JRC*

Aviation Solutions *NEC*

Radio Propagation & Network Simulation, Operations Research

*Kozo Keikaku Engineering Inc.*

Photonics-based Millimeter-wave Signal

Generation and Its Distribution

Technology

*NICT*

Introduction to Airport Security Technologies (R&D)

*Hitachi, Ltd.*

Guidelines for Applicants

*Aeronautical Safety College*

Products

*Itochu Aviation Co.*

Products (MRJ)

*Mitsubishi Aircraft Corp.*

Introduction to CARATS (Long-term Vision)

*JCAB*

Notification of APISAT2013 Conference

*JSASS*

Introduction to Long-term R&D Vision

*ENRI*

Mode S Technologies

*ENRI*

Advanced Radar Technologies

*ENRI*

Passive Secondary Surveillance Radar

*ENRI*

Fatigue and Drowsiness Predictor *ENRI*

15:30 Close of Exhibition

*The Third ENRI  
International Workshop on  
ATM/CNS*

**February 19-21, 2013**

