

Twentieth Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-20)

CSA (Communications Satellite Application) WG activities

Proposed Outline

1. The scope /objectives of CSA WG activities

The CSA WG has been discussing many topics on satellite communications matters and has been providing good opportunities to exchange each country's status report on, in particular, digital divide issues as well as the broadband service in the Asia-Pacific region. The CSA WG shared the experiences for realizing cooperation among countries in the region, regarding applications of satellite communications for tele-education, tele-medicine and disaster management, taking into account the needs to resolve the digital divide in the region. On the other hand, new satellite applications, which were based upon advanced satellite technologies, appeared and became available in last few years. The space-based automatic identification system (AIS) is one of the solutions of ship monitoring and the satellite-based Positioning, Navigation and Timing (PNT) is also one of the important satellite applications. In this way, the CSA WG has an increased need for discussing about not only the communications satellite application but also the space technology extensively.

In consideration of the above situation and previous APRSAF-19 discussion, the outline of the CSA WG in the APRSAF-20 is as follows:

1) Sharing experiences and opportunities, and discussing new applications, concepts and technologies of the satellite communications

Until the previous meetings, many discussions have been made and useful information has been exchanged. The CSA WG recognized the significance and effectiveness of satellite communications, especially in the disaster management activities, and shared the experiences learned from the recent activities. The CSA WG will discuss continuously these issues. Moreover, some new applications and efforts, which were planned, demonstrated and operated in the region, were introduced. The CSA WG will also discuss these activities widely including a

Appendix C

promotion of new applications or concepts of the satellite communications under the regional cooperation. In the APRSAF-20, the CSA WG will have a joint session with ICSANE (International Conference on Space, Aeronautical and Navigational Electronics 2013) and discuss new and viable technical topics of electronics system in spacecraft and ground facilities in the area of navigation and communications systems.

2) Reporting new trend for ship monitoring and space debris

A space-based automatic identification system(AIS), which is a new satellite application in the world and enables to expand the monitoring area from coastal area to ocean, is one of the solutions of ship monitoring. This trend was started by Europe and America several years ago, but now some countries in Asia-pacific region are performing this space-based AIS activity. The CSA WG will continue to promote this space-based AIS activity in the region.

A space debris is increasing every year and is threatening our satellite operations. The CSA WG will commence to discuss an issue of space debris and relevant matters.

3) Promotion for the activities on the Global Navigation Satellite System (GNSS)

The satellite-based Positioning, Navigation and Timing (PNT) becomes widely used in the Asia-Pacific countries. According to the recommendation of the APRSAF-15, the Asia Oceania regional workshop on Global Navigation Satellite Systems (GNSS) has been continuously held and the “Asia Oceania Multi-GNSS Demonstration Campaign” was successfully established. The summary of the 5th Asia Oceania Regional Workshop on the GNSS will be reported in this WG. The CSA WG will support relevant activities and encourage the expansion of the satellite-based PNT applications commencing with the QZS-1 satellite “MICHIBIKI”.

4) Future work

The communications satellite application provides a solution to a issue facing in this region and produces more effective solutions collaborating with other satellite

Appendix C

systems such as earth observation satellites and navigation satellites. Therefore, restructuring the WG, discussions about the communications satellite application move to other WG which deals with the solution, and this WG would like to shift to discuss efforts of cooperation focusing on the space technologies beyond the borders of the communications satellite. On this point, we have to discuss in the forthcoming WG.

2. The result of CSA WG activities in APRSAF-19

See the attached APRSAF-19 adopted recommendations.

3. The Draft of Agenda

Day-1 (Dec. 3) is scheduled for the joint session with ICSANE 2013.

- 1) Opening of the session
- 2) Adoption of the agenda
- 3) General introduction and guidance of CSA WG
- 4) Presentations of communications satellite systems and applications
 - a. Communications Satellite Systems
 - b. Current Status in Asia Pacific Region
- 5) Activity reports of communications satellite applications
 - a. Study report
 - b. Country report
 - c. General Discussion
- 6) Activity reports of ship monitoring (Space-based AIS)
- 7) Activity reports of space debris
- 8) Activity reports of the Multi GNSS
 - a. Report of 5th Asia Oceania Regional Workshop on the GNSS
 - b. Study report
 - c. General Discussion
- 9) Overall discussion and future work
- 10) Closing of the session

CSAWG Agenda
APRSAF-20 Day-1 (December 3, 2013) 9:00 - 17:00

Appendix C

Co-Chairs:

Prof. Pham Anh Tuan (Vietnam National Satellite Center (VNSC), Vietnam)
 Mr. Hiroki Kohata (Japan Aerospace Exploration Agency, Japan)

Time	Title	Presenter
Opening of the session		
9:00-9:05	Remarks by the Co-Chair	Prof. Pham Anh Tuan Vietnam National Satellite Center (VNSC) Vietnam
9:05-9:10	Remarks by the Co-Chair	Mr. Hiroki Kohata Japan Aerospace and Exploration Agency (JAXA) Japan
9:10-9:15	Adoption of the Agenda	Co-chairs
Joint Session with ICSANE 2013		
9:15-9:30	Opening Remarks by the Chair of ICSANE 2013	
9:30-9:50	(25) Cryogenic CMOS analog switch for far-infrared image sensors	Ngoc Tran Minh (DASI Center (HUST)), Hung Nguyen Viet, Khanh Nguyen Phu, Thuong Nguyen Van (HUST), Tuan Le Anh (DASI Center (HUST))
9:50-10:10	(26) TSUBAME Microsatellite: Design, Development and Verification of Attitude Determination and Control System	Le Xuan Huy, Kamiya Takashi, Hao Ting, Kawajiri Shota (TITECH), Matunaga Saburo (TITECH, ISAS/JAXA)
10:10-10:30	(27) BepiColombo MMO Development Status	Hironori Maejima, Hajime Hayakawa, BepiColombo Project (JAXA)
(Coffee Break)		
10:45-11:05	(28) Towards Virtualization Technology on Satellite On-board Computer System with Hardware Redundancy, Software Rejuvenation and Virtual Machine Live Migration Techniques -- Modeling, Analysis and Implementation Proposal --	Tuan Anh Nguyen, Dohwan Lee, Jong Sou Park (KAU)
11:05-11:25	(29) An application to the wild fire detection of the uncooled micro bolometer camera onboard a small satellite	Tetsuya Fukuhara (Hokkaido Univ.)
11:25-11:45	(30) Small Synthetic Aperture Radar Satellite Micro X SAR	Hirobumi Saito, Atsushi Tomiki, Prilando Rizki Akbar, Takashi Ohtani, Kunitoshi Nishijo (JAXA), Jiro Hirokawa, Makoto Ando (Tokyo Institute of Technology)
11:45-12:05	(31) Preliminary Study on Micro X SAR Mission using SDS Bus System	Takashi Ohtani, Hiroyuki Morishita, Moto Takai, Koichi Fujihira, Yoshiyuki Miura, Yuta Nakajima, Naoki Nishimura, Koichi Inoue, Hirobumi Saito (JAXA)
12:05-12:25	(32) Development of the X-band High Speed Downlink Transmitter for Nano Satellite	Tomoya Fukami, Hiromi Watanabe (Tokyo Univ.), Atsushi Tomiki (JAXA), Naohiko Iwakiri (Tokyo Univ.), Hirobumi Saito (JAXA), Shinichi Nakasuka (Tokyo Univ.)
(Lunch Break)		
13:30-13:50	(33) A Vehicle Monitoring and Navigation System Design based on Android Smartphone	Ha Duyen Trung, Do Trong Tuan, Hoang Van Dung, Phuong Xuan Quang, Pham Tien Hung, Ta Hai Tung (Hanoi Univ. of Sci. and Tech.)
13:50-14:10	(34) Demonstration of Multi-GNSS Advanced RAIM Algorithm using GPS	Hieu Tran Trung (NAVIS Centre), Letizia Lo Presti (Polito)
14:10-14:30	(35) Experiments on the Ionospheric Models in GNSS	La The Vinh, Phuong Xuan Quang (HUST), Jose M. Juan Zornoza, Jaume Sanz Subirana, Alberto Garcia Rigo (UPC)
14:30-14:50	(36) Ionospheric Activity in the South East Asian Region	J. Miguel Juan, Jaume Sanz (gAGE/UPC), Roberto Prieto, Stefan Schlueter (ESA)
14:50-15:10	Award Ceremony and Closing Address	
(Coffee Break)		
Presentations of communications satellite systems and applications		
15:30-15:45	Review of the last CSAWG at Kuala Lumpur	Co-chairs
15:45-16:10	(Satellite System 1) A Study of HST Communication System	Mr. Yoichi Koishi NEC corporation Japan
16:10-16:35	(Satellite System 2) Evolution for Mitsubishi DS2000 Platform	Mr. Eiichi Hikima Mitsubishi Electric Corporation Japan
16:35-17:00	(Satellite System 3) Turkish Indigeneous Communication Satellite Initiatives	Mr. Tamer Beser TUBITAK Space Technologies Research Institute Turkey

CSAWG Agenda
APRSAF-20 Day-2 (December 4, 2013) 9:00 - 17:00

Appendix C

Co-Chairs:

Prof. Pham Anh Tuan (Vietnam National Satellite Center (VNSC), Vietnam)

Mr. Hiroki Kohata (Japan Aerospace Exploration Agency, Japan)

Time	Title	Presenter
Opening of the session		
09:00-09:05	Report of the Day 1 discussion	Co-chairs
09:05-09:15	Self introduction	(ALL)
Activity reports of the Multi-GNSS		
9:15-9:40	(GNSS 1) Report on the 5th Asia Oceania Regional Workshop on GNSS	Mr. Hiroaki Tateshita Japan Aerospace and Exploration Agency (JAXA) Japan Secretariat of Multi-GNSS Asia (MGA)
9:40-10:05	(GNSS 2) GINESTRA: results of the survey in SEA & Pacific Regions	Prof. Gabriella Povero ISMB Italy
10:05-10:30	(GNSS 3) Multi-GNSS positioning solutions in South-East Asia	Dr. Tung Hai Ta Hanoi University of Science and Technology Vietnam
<i>(Coffee Break)</i>		
10:45-11:05	(GNSS 4) Design and Management for Creating Innovative Social Services with Communications Satellite System, GNSS and Big Data	Naohiko Kohtake Associate Professor, Keio University Japan
Activity Reports of Ship Monitoring (Space-based AIS)		
11:05-11:30	(AIS 1) Ship Monitoring Activities in JAXA	Mr. Koichi Oshimura Japan Aerospace and Exploration Agency (JAXA) Japan
11:30-11:55	(AIS 2) Space Based-AIS: Near Equatorial Region and Ground Data Sharing Possibilities	Mr. Muhamad Yoyok Ikhsan National Institute of Aeronautics and Space (LAPAN) Indonesia
11:55-12:20	(AIS 3) GOWA2 program overview	Mr. Atsushi Karaki IHI cooperation Japan
<i>(Lunch Break)</i>		
13:30-13:55	(AIS 4) CLS SAT-AIS technology & services / update on VHF Data Exchange System (VDES)	Mr. Gaetan Fabritius Collecte Localisation Satellites (CLS) France
Activity Reports of Communications Satellite Applications		
13:55-14:20	(Study Report 1) Research on Earth to Satellite Propagation at the Nanyang Technological University's School of Electrical and Electrical Engineering	Dr. Jin Teong Ong C2N Pte. Ltd. Singapore
Activity Reports of Space Debris		
14:20-14:45	(Space Debris 1) Research Topics for Asia-Pacific Regional Collaboration in the Area of Orbital Debris Issues	Prof. Toshiya Hanada Kyushu University Japan
Concluding Session		
14:45-15:30	Overall discussion and future work	(ALL)
<i>(Coffee Break)</i>		
Concluding Session (Cont'd)		
15:45-16:45	Overall discussion and future work (Cont'd)	(ALL)
16:45-17:00	Closing of the Session	(ALL)