

Attending Australian Space Research Conference and Space Weather Workshop 2017

Name : Prayitno Abadi

Affiliation : Division for Ionospheric and
Magnetospheric Research

Duration of the stay : 2017/12/13~12/17

Name & country of the workshop : The 17th
Australian Space Research Conference, Sydney, Australia

I had attended two meetings during 13-17 Nov 2017 in University of Sydney, Sydney, Australia; the 17th Australian Space Research Conference (ASRC) from 13 to 15 Nov 2017 and the Space Weather Workshop from 16 to 17 Nov 2017. The ASRC has some sessions, such as Space and Atmospheric Physics, Solar Systems and Exoplanets, GPS and GNSS, Space Business and Technologies, Mars, Cubesats, Space Mission and Projects, and Space Archeology. Mostly, I had attended presentations at Space and Atmospheric Physics session. I had presented a poster entitled "Longitudinal Variation of Equatorial Plasma Bubble in Southeast Asia" for that session on 13 Nov 2017. Fig. 1 shows one of my poster's visitors reading the poster. I have noticed several inputs for my study from the visitors of my poster. Especially, I was suggested (1) to add GPS TEC observation to strengthen the difference of the equatorial electrojet (EEJ) between western and eastern sectors of Southeast Asia, (2) to consider the difference of latitude's magnetometers (the instrument used to derived the EEJ) between western and eastern sectors, and (3) to use space-based observation of scintillation occurrence to support the existence of longitudinal variation in the plasma bubble occurrence in Southeast Asia. In addition, I was impressed with several presentations during the ASRC, that is, "the role of gravity waves in seeding unseasonal equatorial plasma bubble" by Dr. Julie Curie of RMIT, "unseasonal development of F-region irregularities over Southeast Asia on 28 July 2014" by Dr. Brett Carter of RMIT, and "relating the temporal and spatial characteristics of travelling ionospheric disturbances signatures across a network of oblique angle-of-arrival ionosondes" by Dr. Andrew Heitmann of DST, Australia.

In the end of ASRC, there were the discussion for establishing Australian Space Agency and the announcements for the best student presentation awards for poster and oral talks. I got the 2nd-runner up best student presentation for poster.

The Space Weather Workshop was organized by Australian Bureau of Meteorology (BOM). The workshop aimed to promote the products of the Space Weather Services of BOM to the potential users. I was very impressed with the effort of BOM to reach also the aurora's photographer in Australia. The BOM provides aurora prediction based on solar eruption occurrence and a near real-time observation of aurora occurrence to alert the photographers. Surprisingly, the most users of space weather services from the BOM are aurora photographers. Finally, I would like to thank CCIR-ISEE of Nagoya University for supporting my attendance at these two meetings.



Fig.1 One of the visitors reading my poster at the ASRC 2017.

<Supervisor's name>

Dr. Yuichi Otsuka

A Two-week Visit to RMIT University

Name : Prayitno Abadi

Affiliation : Division for Ionospheric and
Magnetospheric Research

Duration of the stay : 2017/12/18~12/29

Name & country of the institution : Royal
Melbourne Institute of Technology (RMIT) University

My two-week visit to RMIT (Royal Melbourne Institute of Technology) University in Melbourne, Australia aimed to collaborate with Dr. Brett Carter and Dr. Julie Curie working on my recent study about the longitudinal variation of equatorial plasma bubble (EPB) in Southeast Asia. The EPBs are depletions at nighttime equatorial F-region plasma and consist of irregularities that can cause scintillation on trans-ionospheric radio propagation, such as GPS-based systems. Therefore, understanding the EPB occurrence is important. My recent study found that the EPB occurrence rate in the western sector of Southeast Asia is higher than in the eastern sector based on equatorial spread-F (ESF) observation from ionosondes and scintillation measurement from GPS receivers (see Fig. 1(a-b)). On 18 Nov 2017, we had a short discussion with Dr. Carter about detailed plan of my research activity during my visit. We decided to investigate the longitudinal variation of scintillation occurrence in Southeast Asia by analyzing radio occultation (RO) data taken from the COSMIC satellite. The data are available on the website: <http://cdaac-www.cosmic.ucar.edu/cdaac/products.html>. Fig. 1, which is a summary of the obtained preliminary results, displays the histograms showing the longitudinal variation of EPB using ground-based observation and COSMIC-RO. Fig. 1(a) shows locations of ionosondes and GPS receivers used in this study. Fig. 1(b) shows the difference of ESF and scintillation occurrence between western and eastern sectors in Southeast Asia. Fig. 1(c) shows the histogram of scintillation occurrence from west to east sector in Southeast Asia based on the COSMIC-RO data. The findings shown in Fig. 1 remark a tendency that the occurrence of the EPB decreases from west to east in Southeast Asia, and both

ground-based observations and COSMIC-RO show a consistent result, which is higher scintillation occurrence in the western sector rather than in eastern sector. Finally, we suggest that the existence of longitudinal variation in the EPB occurrence in Southeast Asia. In addition to my research activity during my visit, I had given a talk about the zonal spacing of the multiple EPB occurrence. at RMIT on 24 Nov 2017. While brief, I enjoyed my two-week visit to RMIT. I would like to thank CCIR-ISEE of Nagoya University for supporting this visit. I would like also thank Brett and Julie for fruitful discussion and friendly welcome.

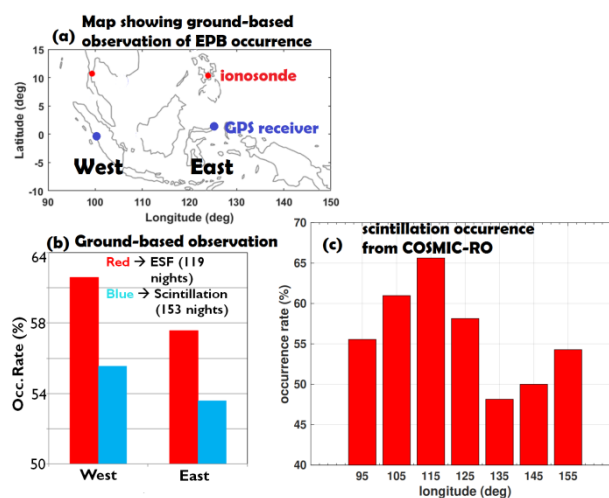


Fig. 1 (a) Location of ionosondes (red dots) and GPS receivers (blue dots) in the western and eastern sectors in Southeast Asia. (b) Histogram of ESF and scintillation occurrence rates in the western and eastern sectors of Southeast Asia. (c) Histogram of scintillation occurrence rate obtained from COSMIC-RO observation.

<Supervisor's name>

Dr. Yuichi Otsuka