Commission G Report

September 25, 2017

1. Meeting announcement/report

- The 18th EISCAT symposium (EISCAT18) was held from 26th to 30th May 2017 at National Institute of Polar Research (NIPR), Tokyo, Japan, in connection with the 15th MST (Mesosphere/Stratosphere/Troposphere) radar workshop (MST15). Two meetings shared the venue and part of sessions are conducted together. Total participants in workshop and symposium were 182 (62 in-Japan participants from 18 Japanese institutes and 120 foreign participants from 67 foreign institutes in 18 countries.). In total, we had 146 oral presentation (including 31 invited presentation) and 87 posters. This was the largest meeting for both EISCAT18 and MST15. We will publish papers from the meeting as Earth, Planets and Space (EPS) journal special issue.

  http://eiscat.nipr.ac.jp/about/18th_eiscat_symposium.html
  http://www2.rish.kyoto-u.ac.jp/mst15/index.html

- Joint IAPSO-IAMAS-IAGA Assembly was held in Cape Town, South Africa. The Joint Assembly, endorsed by the University of Cape Town and the South African Department of Science and Technology, took place from 27 August to 1 September 2017 at the Cape Town International Convention Centre (CTICC).

  http://iapso-iamas-iaga2017.com/index.php

- MU radar /Equatorial Atmosphere Radar Symposium was held at RISH, Kyoto University on September 7-8, 2017. This is the annual meeting for the cooperative use of the facilities. Commission G of Japanese URSI co-sponsors this symposium.

2. Topics

2.1. Masterplan 2017

Research Institute for Sustainable Humanosphere (RISH), Kyoto University, National Institute of Polar Research (NIPR), Institute for Space-Earth Environmental Research (ISEE), Nagoya University, and International Center for Space Weather Science and Education (ICSWSE), Kyushu University proposed the research project “Coupling process in the solar-terrestrial system” (PI: Prof. Toshitaka Tsuda at RISH, Tsuda et al. [2016]) to Masterplan 2017 of Science Council of Japan (SCJ). This project is to establish Equatorial MU (EMU) radar in Sumatera Island, Indonesia, EISCAT_3D radar in northern Scandinavia under international collaborations, global observation network of geomagnetic field and airglow imagers. In February 2017, our plan was successfully approved as one of 28 important large research projects. We further proposed this project to Roadmap 2017 of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in April, but unfortunately fail to be approved on the list. We will continue pursue success of this project.

Announcement Masterplan 2017 by SCJ http://www.scj.go.jp/ja/info/kohyo/kohyo-23-t241-1.html

3. Research Report

3.1. Report from National Institute for Polar Research (NIPR)
(Yasunobu Ogawa, NIPR)

=== Research activity related to PANSY ===

JpGU-AGU Joint Meeting 2017 Session A-AS10 "Interhemispheric and intrahemispheric coupling of the atmosphere"

http://www.jpgu.org/meeting_2017/session_list/detail/A-AS10.html

=== Recent papers related to PANSY ===

Shibuya, R., K. Sato, M. Tsutsumi, T. Sato, Y. Tomikawa, K. Nishimura, and M. Kohma, Quasi-12 h inertia–gravity waves in the lower mesosphere observed by the PANSY radar at Syowa Station

(39.6° E, 69.0° S), Atmos. Chem. Phys., 17, 6455-6476, https://doi.org/10.5194/acp-17-6455-2017, 2017.

Tsutsumi, M., K. Sato, T. Sato, M. Kohma, T. Nakamura, K. Nishimura, and Y. Tomikawa, Characteristics of mesosphere echoes over Antarctica obtained using PANSY and MF radars, SOLA, 13A, in press, 2017.

Hashimoto, T., K. Nishimura, M. Tsutsumi, K. Sato and T. Sato, A user parameter-free diagonal-loading scheme for clutter rejection on radar wind profilers, J. Atmos. Oceanic Technol., 34, 1139-1153. doi:10.1175/JTECH-D-16-0058.1, 2017.

=== Research activity related to EISCAT ===

Start of EISCAT_3D project was decided in May 2017. The opening event for the construction of the first stage of the EISCAT_3D system took place in Tromsø, Norway on 7 September 2017.

https://eiscat3d.se/content/eiscat3d-opening-event

=== Recent papers related to EISCAT ===

Adachi, K., S. Nozawa, Y. Ogawa, A. Brekke, . M. Hall, and R. Fujii, Evaluation of a method to derive ionospheric conductivities using two auroral emissions (428 and 630 nm) measured with a photometer at Tromsoe (69.6°N), Earth, Planets and Space EPSP-D-16-00217, in press, 2017.

Yamazaki, Y., M. J. Kosch, and Y. Ogawa, Average field-aligned ion velocity over the EISCAT radars, J. Geophys. Res., DOI: 10.1002/2017JA023974, May, 2017.

3.2. Report from Institute for Space-Earth Environmental Research (ISEE), Nagoya University
(Satonori Nozawa, Nagoya University)

=== Research topics ===

Tan et al. (2017) showed density variability of nighttime D-region ionosphere using reflection height of tweek atmospherics recorded at Vietnam and Japan. Yonezu et al. (2017) reported simultaneous observations of magnetospheric ELF/VLF emissions in Canada, Finland, and Antarctica, based on 48 days of data, and showed how the simultaneous occurrence rate of chorus/hiss emissions decreases as the local time separation increases.

== Recent papers ===

Tan, L. M., K Shiokawa, N. N. Thu and T. Q. Ha, Density variability of nighttime D-region ionosphere in Vietnamese and Japanese sectors, J. Geophys. Res., 122, doi: 10.0002/2017JA024025, 2017.

Yonezu, Y., K. Shiokawa, M. Connors, M. Ozaki, J. K Manninen, H. Yamagishi, and M. Okada, Simultaneous observations of magnetospheric ELF/VLF emissions in Canada, Finland, and Antarctica, J. Geophys. Res., 122, doi: 10.0002/2017JA024211, 2017.

3.3. Report from National Institute for Information and Communications Technology (NICT)
(Minoru Kubota, NICT)

=== Recent papers===

Chen, G., H. Jin, J. Yan, S. Zhang, G. Li,T. Yokoyama, G. Yang, C. Yan, C. Wu, J. Wang, D. Zhong, Y. Li, and Z. Wang, Low-latitude daytime F-region irregularities observed in two geomagnetically quiet days by the Hainan coherent scatter phased array radar (HCOPAR), J. Geophys. Res. Space Physics, 122, 2645-2654, doi:10.1002/2016JA023202, 2017.

Fukushima, D., K. Shiokawa, Y. Otsuka, M. Kubota, T. Yokoyama, M. Nishioka, S. Komonjinda, and C. Y. Yatini, Geomagnetically conjugate observations of ionospheric and thermospheric variations accompanied by a midnight brightness wave at low latitudes, Earth Planets Space, 69, 112, doi:10.1186/s40623-017-0698-z, 2017.

Jamjareegulgarn, P., P. Supnithi, K. Watthanasangmechai, T. Yokoyama, T. Tsugawa, and M. Ishii, A new expression for computing the bottomside thickness parameter and comparisons with the NeQuick and IRI-2012 models during declining phase of solar cycle 23 at equatorial latitude station, Chumphon, Thailand, Adv. Space Res., 60,329-346, doi:10.1016/j.asr.2016.11.003, 2017.

Jiang, C., G. Yang, J. Liu, T. Yokoyama, T. Liu, T. Lan, C. Zhou, Y. Zhang, Z. Zhao, T. Komolmis, P. supnithi, and C. Y. Yatini, Equatorial and low-latitude ionospheric response to the 17-18 March 2015 great storm over South East Asia longitude sector, J. Geophys. Res. Space Physics, 122,5756-5767, doi:10.1002/2017JA024134, 2017.

Maruyama, T., Guanyi Ma, Takuya Tsugawa, Pornchai Supnithi and Tharadol Komolmis, Ionospheric peak height at the magnetic equator: Comparison between ionosonde measurements and IRI, Advances in Space Research, Vol.60(2), 375-380, doi:10.1016/j.asr.2016.10.013, 15 July 2017.

M Buhari, S., M. Abdullah, T. Yokoyama, Y. Otsuka, M. Nishioka, A. Hasbi, S. A. Bahari, and T. Tsugawa, Climatology of successive equatorial plasma bubbles observed by GPS ROTI over Malaysia, J. Geophys. Res. Space Physics, 122, 2174-2184, doi:10.1002/2016JA023202, 2017.

Tao, C., H. Jin, H. Shinagawa, H. Fujiwara, and Y. Miyoshi, Effect of intrinsic magnetic field decrease on the low- to middle-latitude upper atmosphere dynamics simulated by GAIA, J. Geophys. Res. Space Physics, doi:10.1002/2017JA024278, 2017.

Yokoyama, T., and C. Stolle, Low and midlatitude ionospheric plasma density irregularities and their effects on geomagnetic field, Space Sci. Rev., 206, 495-519, doi:10.1007/s11214-016-0295-7, 2017.

3.4. Report from Kyushu University
(Huixin Liu, Kyushu University)

=== Recent papers===

Liu H., N. Pedatella, K. Hocke, Medium-scale gravity wave perturbations in the bottomside F region in tropical regions, Geophys. Res. Lett., 44, 7099-7105, doi: 10.1002/2017GL073855, 2017.

Liu H., J. Thayer, Y. Zhang, W. Lee, The non-storm time corrugated upper thermosphere: What's beyond MSIS, Space Weather, 15, doi: 10.1002/2017SW001618, 2017.

Liu H., Y. Sun, Y. Miyoshi, H. Jin, ENSO effects on MLT diurnal tides: A 21 year reanalysis data-driven GAIA model simulation, J. Geophys. Res., 122, doi: 10.1002/2017JA024011, 2017.

3.5. Report from Electronic Navigation Research Institute (ENRI)
(Susumu Saito, ENRI)

=== Recent papers===

Saito, S., and T. Yoshihara, Evaluation of extreme ionospheric total electron content gradient associated with plasma bubbles for GNSS Ground-Based Augmentation System, Radio Science, 52, doi:10.1002/2017RS006291, 2017.

Saito, S., S. Suzuki, M. Yamamoto, C. H. Chen, and A. Saito, Real-time ionosphere monitoring by three-dimensional tomography over Japan, Journal of Institute of Navigation, in press, 2017.

Saito, S., S. Sunda, J. Lee, S. Pullen, S. Supriadi, T. Yoshihara, M. Terkildsen, F. Lecat, and ICAO APANPIRG Ionospheric Studies Task Force, Ionospheric delay gradient model for GBAS in the Asia-Pacific region, GPS Solutions, in press, 2017.

3.6. Report from Research Institute for Sustainable Humanosphere (RISH), Kyoto University
(Mamoru Yamamoto, RISH)

=== Recent papers===

Tulasi Ram, S., K. K. Ajith, T. Yokoyama, M. Yamamoto, and K. Niranjan, Vertical rise velocity of equatorial plasma bubbles estimated from Equatorial Atmosphere Radar (EAR) observations and HIRB model simulations, J. Geophys. Res. Space Physics, 122, 6584-6594, doi:10.1002/2017JA024260, 2017.

Dao, T., Y. Otsuka, K. Shiokawa, M. Nishioka, M. Yamamoto, S. M. Buhari, M. Abdullah, and A. Husin (2017), Coordinated observations of postmidnight irregularities and thermospheric neutral winds and temperatures at low latitudes, J. Geophys. Res. Space Physics, 122, 7504?7518, doi:10.1002/2017JA024048.

Pavan Chaitanya, P., A. K. Patra, Y. Otsuka, T. Yokoyama, M. Yamamoto, R. A. Stoneback, and R. A. Heelis (2017), Daytime zonal drifts in the ionospheric 150 km and E regions estimated using EAR observations, J. Geophys. Res. Space Physics, 122, doi:10.1002/2017JA024589.