2018 ISEE Award

Winner: Dr. Hisao Takahashi (Professor of post-graduate course, National Institute for Space Research (INPE), Brazil)

Title: Contribution to Space-Earth Environmental Research through Studies of Generation and Development of Equatorial Ionospheric Plasma Bubble

Citation:

Above ~100 km on the Earth's atmosphere, electrically charged particles, i.e., "plasma" exists, because a part of the atmosphere is ionized and forming the ionosphere. Around the equator, the ionospheric plasma in a localized area sometimes disappears almost entirely, forming plasma bubble (plasma hole). When the plasma bubble occurs, GNSS positioning error can increase, and satellite broadcast and communication can be degraded. Therefore, the plasma bubble has been studied extensively by many researchers.

Dr. Takahashi has shown, for the first time, using GNSS data over South America that atmospheric waves launched from the tropospheric convection are propagated to an altitude of 300 km, generating wavy structure of the ionospheric plasma. He suggested a possibility that such waves may trigger plasma bubbles after sunset. During his visit to ISEE, Nagoya University, in 2016 as a visiting professor, he organized an international workshop, and led global discussion on generation and development of plasma bubbles. The results of the workshop have been published in 13 scientific papers in a special issue of the international journal, Progress in Earth and Planetary Sciences.

For the above reasons, the first ISEE award is awarded to Dr. Takahashi.

Carrier of the winner

Dr. Hisao Takahashi has received his Master of Science at Niigata University in 1970, then received his PhD degree in Space Science at National Institute for Space Research (INPE), Brazil, in 1980. Since then, he has been working at INPE as a research staff of Aeronomy Division. He served as Head of Aeronomy Division, and General manager of Space weather Program of INPE. He has been carrying out measurements of Aurora and Airglow to study atmospheric waves and their impacts on the Earth's upper atmosphere.