

technology for ionogram data based on AI, and implemented a data assimilation algorithm in the atmospheric and ionospheric model (GAIA). The Center enhanced magnetospheric simulators using solar wind data as one of the inputs to contribute to the space environment monitoring and forecasting that are essential to the safe operation of artificial satellites. The Center also developed a risk estimation system for spacecraft charging (surface/internal) using magnetospheric simulations in collaboration with Osaka Prefecture University and JAXA (Fig. 4). Furthermore, the Center jointly developed with Nagoya University an ensemble solar wind arrival prediction system that reproduced the shock waves caused by arriving solar winds by simulations. The aim of such research and development is to improve high-precision early warning systems based on solar radio wave observations and solar wind simulations.

To enable the use of space weather information in civil aviation operations, the International Civil Aviation Organization (ICAO) selected the ACFJ consortium, consisting of Japan, Australia, Canada, and France, as one of ICAO Global Space Weather Centers. The new service started in November 2019. Also, the Center started 24/7 operations of space weather monitoring and forecasting from December 2019.

Electromagnetic Standards Research Center

In the field of electromagnetic environment technology, the Electromagnetic Standards Research Center conducts research and development on Electromagnetic Compatibility (EMC), which is the ability of electrical and electronic devices and communication systems to operate without mutual effects which can deteriorate their functions and performances, in terms of electromagnetic, impacts, and on Biomedical EMC that enables the safe and secure use of new wireless systems as well as current ones. These activities aim to help build safe and secure electromagnetic environments in response to diversified utilization of radio waves.

In the field of advanced EMC measurement technology, the Center conducted



Radioonde launching from test field at NICT headquarters

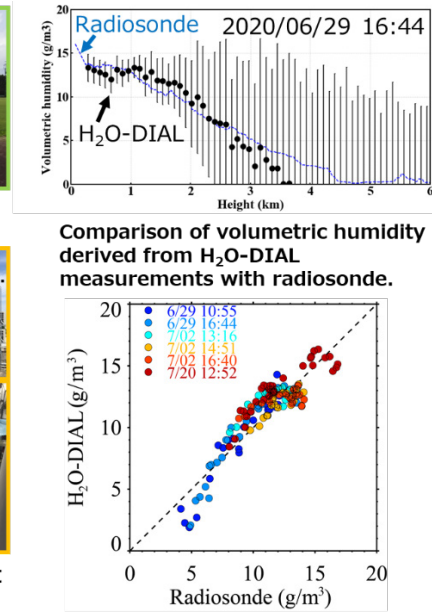


Fig.2 : Validation of H₂O-DIAL-derived water

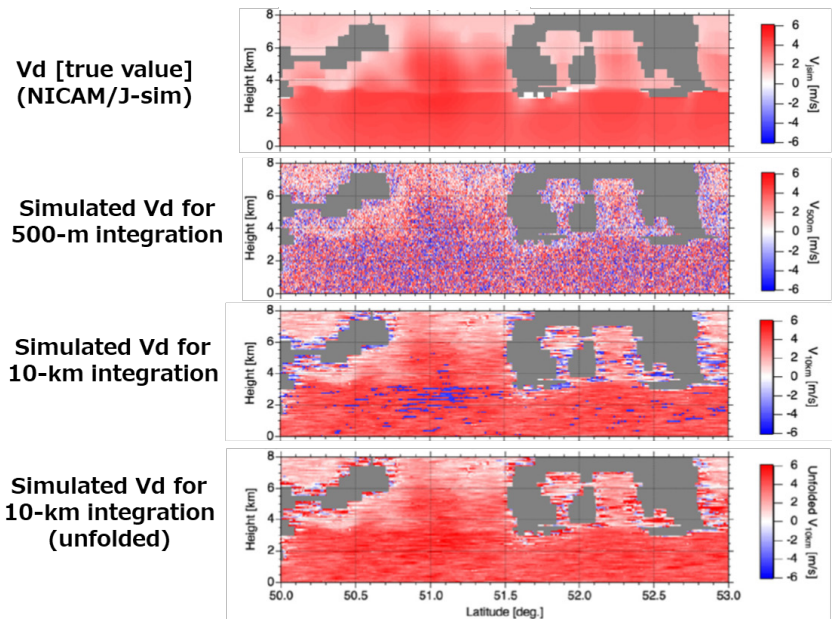


Fig.3 : Assessments of doppler velocity errors of EarthCARE/CPR with numerical simulations

studies about the following subjects:

- Electromagnetic interference with wireless communication systems due to electromagnetic noise generated from energy-saving electrical equipment
- Development for broadband and highly efficient antennas used for RF immunity tests in close proximity according to new international standards

- Development of high-speed spectrum measurement devices for unwanted (spurious) waves containing broadband frequency components emitted from radar or similar equipment, and measurement methods and test sites for radiated disturbances (electromagnetic noise that is radiated into space and interferes with communication) at 30 MHz or below that are emitted by household appli-