Mid-term Research Plan of NICT Space Weather Monitoring and Forecast

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National Institute of Information and Communications Technology, Japan (NICT) starts the fifth mid-term research plan since April 2021. Space Environment Laboratory, NICT is in charge of operational space weather monitoring and forecast in Japan, and the new research and development plan for space weather monitoring and forecast starts at the same time.

NICT has a long history to observe space weather phenomena with ground-based sensors, e.g., ionosondes, solar radio telescope, and GNSS receivers. In addition to the domestic observation, we have an international cooperative project for monitoring ionospheric disturbance in the equatorial region e.g., equatorial plasma bubbles (EPBs) in South-east Asia. We will try to extend the network under the cooperation. In addition, we will seek the opportunity of development of satellite-based sensors.

Prediction models are important to have precise space weather forecast. We have been developing numerical code for predicting the response of solar wind, magnetosphere and ionosphere with the solar activities. We will start operational forecast using data assimilation with these numerical codes.

For the dissemination of space weather information, we have been providing space weather forecast since 1988. We keep the communication with information users by establishing space weather users' committee for seeking the requirement of users. We will continue the activity and provide the necessary information for users.

We expect some specific targets of our activity is, high-precision satellite positioning with QZSS, support of deep space exploration for providing space weather information, and mitigation of space weather disaster by providing benchmark.

Keywords: space weather, ionosphere, magnetosphere, sun/solar wind

