Japanese Activity for Extreme Space Weather Event

Mamoru Ishii
National Institute of Information and Communications Technology, Japan
NICT Space Weather Forecast Center

Forecasting Parameters
- Flare forecast
- Magnetic field forecast
- High-energy particle forecast
- HF propagation forecast

Domestic users: satellite operator, aviation office and companies, power plant companies, HF telecommunicator / broadcaster, resource survey, Univ. and research institutes, amateur radio

Web access: 160,000/month
No. of e-mail address: 10,000
Ionospheric Observation network
Research Activities for space weather forecast in NICT

- Development of AI system for flare forecast: We reached 0.9 of True Skill Score (TSS)
- Space environment Database with Himawari-8 data was established.
- Some improvements were done in global and regional atmosphere-ionosphere models: make higher resolution and connection.
We developed an operational TEC observation system with high temporal and spatial resolution (30sec, 0.15 by 0.15 deg) using 1,240 points of GPS network “GEONET”
The Asia-Oceania Space Weather Alliance (AOSWA) established on 2010 for information exchange among SWx organizations in Asia and Oceania.

- Members: 27 organizations from 13 countries
- AOSWA workshop is held every one and half years. The last one is hosted by RRA at Jeju, Korea on October, 2016.
- Electric newspaper “AOSWA link” is circulated
**Issues to be solved**

- The effect of SWx to high concentrated ICT society is unknown
- It is necessary to establish an integrated space weather system in the society against extreme SWx event in the next solar cycle.
- Most of potential users do not know the importance of SWx.: necessary to communicate to them

**actions**

- Build a system to provide a useful information for users
- Identified simulation model among sun/solar wind/magnetosphere/ ionosphere
- Establish Japanese original hazardous map for preparedness against SWx extreme events.
Results of different direction source currents

The Japanese land can be regarded as a capacitor because of strong coastal effects with the land shape extending north and south.
Comparisons with uniform the GIC model

 Courtesy of Dr. Satoko Nakamura (Kyoto Univ.)
The “ONLY National Institute” of Information and Communications technology in Japan
- Staff: permanent scientists: 300, temporal scientists: 400, administrative: 200 (approximately).
- Yearly budget: about 30 billion yen
- Headquarter: Koganei, Tokyo
- Main Branches: Keihanna, Kobe, Kashima, Okinawa
- Observatories: Wakkanai, Hiraiso, Yamagawa, Okinawa

Japanese government

MIC  MEXT  METI  Etc,etc

NICT  National Univ.s