NICT space weather Activity Report

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RECENT ACCOMPLISHMENTS
Magnetometer
Ionosonde
Sun and Solar wind
HF radar
Syowa, Antarctica

NICT SWx Obs. Network

Far East Mag.&HF radar network
Operational Ionosphere Obs. Network & Sun and Solar obs. systems

Solar Radio telescope

Mar. 2014
Mar. 2014
Mar. 2014
Mar. 2014

Syowa, Antarctica
SEALION

ACE receiver antenna
New Ionosonde system

Ionosonde

2016-2020?
Space Environment Data Acquisition Monitor (SEDA) will be on board Himawari-8,9

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Channels</strong></td>
<td>Protons: 8 (individual 8 sensor elements)</td>
</tr>
<tr>
<td></td>
<td>Electrons: 8 (8 stacked plates in one elements)</td>
</tr>
<tr>
<td><strong>Energy Range</strong></td>
<td>Protons: 15 MeV – 100 MeV</td>
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<tr>
<td></td>
<td>Electrons: 0.2 MeV – 5 MeV</td>
</tr>
<tr>
<td><strong>Time Resolution</strong></td>
<td>10 sec.</td>
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<tr>
<td><strong>Field of View</strong></td>
<td>Protons: ± 39.35 deg.</td>
</tr>
<tr>
<td></td>
<td>Electrons: ± 78.3 deg.</td>
</tr>
</tbody>
</table>

- High-energy particle environment over Japanese sector will be monitored by SEDA.
- Near-real time SEDA data will be provided from JMA to NICT. We will provide SEDA data as part of space weather information.

Longitude: ~140 deg.
Himawari-8 Launch: Oct. 7, 2014 (Planning)
Himawari-9 Launch: 2016
LSWS at the Bottomside, Plumes at the Topside (Yokoyama et al.)
• AOSWA: Asia-Oceania Space Weather Alliance
• Grown up from SEALION cooperation spirit
• Kick off: December 2010 with five countries
• Objective: make a regional linkage of information of space weather for operations and researches
• Recent meeting: Nov 4-7, 2013, Kunming, China

• Next: Mar. 2-5, 2015, Fukuoka, Japan

Please come and join us!
Candidate of Next AOSWA workshop
HIGHEST PRIORITY DATA NEEDS
Ionospheric information above ocean

• It is necessary to get ionospheric information above ocean for use of aviation.

• Candidate of observation methods
  – Oblique sounding with ionosonde
  – Trans equatorial propagation
  – GPS buoy
  – Satellite occultation
Oblique sounding with ionosondes

• NICT are now routinely operates oblique sounding ionogram every 15 min.
• NICT and KSWC are discussing international oblique sounding project with VIPIR system.
• Development and observation with simple receivers will make possible to increase observation points.
Trans-Equatorial Propagation (TEP)
From April 2015, an international consortium, ICCON, will begin the operation of NoRH instead of NAOJ. We need more contribution for the stable operation of NoRH and for producing more scientific outputs. Any contribution is welcome for the continued operation.
LATEST INFORMATION ON USER IMPACTS
Survey of Space Weather user needs

- **Questioner**
  - Asked 23 fields, 50 organizations/companies by telephone
  - 11 organizations uses space weather information

- **Interview**
  - 10 organizations/companies: Airline pilot, resource survey, electric power company, airplane navigation, exposure control of astronauts

- **Needs**
  - SW Information easy to use for non-scientists
  - Revise our web site for easy access of our data
  - Build training course for business use of space weather
The wall to be overclimbed

• Feedback of event information
  – The ultimate target of operational space weather is “Taylor-made SWx” in which SWx information are adjusted for each customer.
  – For the achievement, it is necessary to feedback the event information; what happen in which SWx events in detail (quantitatively).
  – However nowadays almost ally customer does not provide these kinds of information.
Hit rate of Flare forecast

![Graph showing the hit rate of Flare forecast with different cities and months.](image)
Threat score of Flare forecast
Hit rate of Magnetic activities

![Graph showing hit rate of Magnetic activities]

- Hit rate of Magnetic activities
- Chart showing the hit rate of Magnetic activities over months for different cities.
Threat score of magnetic activities
Summaries

• Operational activities
  – Forecast briefing is held on everyday
  – Provide SW forecast information with email, Web, FAX, and telephone
  – Survey SW user needs

• NICT Scientific activities
  – Two main targets: nowcasts and forecasts of space weather in the ionosphere and along geostational orbit
  – Model/simulation as the core technique and observation as following the core.

• Cooperative activities: AOSWA, intern students
• Toward the “Tayler-made space weather” but needs for particular users are difficult to get.
• We need to determine the hazardous level of SWx.
• Ionophseric information above the ocean.