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Committee on the Peaceful Uses of Outer Space

Reports on national and regional activities related to the International Space Weather Initiative

Note by the Secretariat

This pdf contains only the report for Japan.

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relying on signals received from GPS stations. It undertakes surveys of software and models designed to calculate and predict ionospheric factors and to warn of possible interruptions in communications.

In view of the importance of the ionosonde system in serving all security-related ministries and the media, and as a response to a request by the Ministry of Interior to reactivate the ionosphere survey and monitoring system, a survey of modern ionosphere monitoring technologies was initiated to identify the optimal systems for the beneficiaries.

Ozone

The Centre monitors changes in the ozone layer through space data and images available from some international monitoring stations. Such data are used in studies and reports to help understand scientific facts and changes affecting the ozone layer. Given the importance of the ozone layer in protecting the environment from exposure to ultraviolet rays, sensors were provided to measure the ozone concentration at different altitudes, within the Space Environment Monitors project.

Moreover, the Centre plans to provide the necessary tools (receiver station, data and image presentation equipment, data verification and storage facilities, and report-production facilities) to monitor solar, magnetic and ionospheric factors and to archive data for use in research and studies. The Centre seeks to have its technical staff participate in scientific workshops, using available data related to the atmosphere, which is affected by solar activity (in particular the ionosphere, the Earth's magnetic field and the ozone layer) for further development in this domain.

Japan

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[29 October 2010]

In Japan, the Solar Terrestrial Physics Programme (STPP) subcommittee of the Science Council is participating in the International Space Weather Initiative as a follow-on programme of the International Heliophysical Year. The Chair of the STPP subcommittee (Kiyohumi Yumoto of Kyushu University) and other members of the subcommittee are moving forward with their instrument deployment plans and are constructing database systems for public access. The table shows a list of Japanese scientists who have deployed instrumentation overseas and will gradually make all acquired data available for public use (with some conditions attached). The leading instrument programmes (CHAIN, GMDN, MAGDAS, OMTIs, SEALION) have been actively expanding their operations since the beginning of 2010. Also, the National Institute of Information and Communications Technology (NICT) has actively expanded space weather outreach activities. It should be noted that more members of the STPP subcommittee are preparing to join the instrument programme or establish database systems, or both.

To create awareness of the International Space Weather Initiative in Japan, the STPP subcommittee organized a meeting at Kyushu University in March 2010. Soon after that, a session dedicated to the Initiative was held during the international symposium of the Japan Geoscience Union on 25 and 26 May. During that session,

host scientists in charge of instruments and contributors who provide their own data to the Initiative presented their achievements and future plans. Several foreign researchers were invited to present their activities with particular emphasis on international collaboration. The symposium will be held every year in Japan during the International Space Weather Initiative (2010-2012).

Outside Japan, three major International Space Weather Initiative workshops are scheduled: in Egypt in 2010, in Nigeria in 2011 and in Ecuador in 2012. The 2010 International Space Weather Initiative United Nations/NASA/JAXA workshop was held on the campus of Helwan University, Egypt, from 6 to 10 November 2010.

Several instrument array sessions are scheduled. One of those is the Magnetic Data Acquisition System (MAGDAS) session, where 31 persons (mainly MAGDAS hosts from all over the world, but mostly from Africa) are scheduled to deliver 20-minute talks. The general theme of the MAGDAS session is capacity-building, which consists of three phases: (a) development of instrument capacity, (b) development of data analysis capacity and (c) development of science capacity. Capacity-building is one of the major goals of the International Heliophysical Year and the International Space Weather Initiative, as specified by the organizers of those initiatives. Because of MAGDAS hosts, the Space Environment Research Center is able to successfully operate ground observatories all over the world. This is a good example of the International Space Weather Initiative in action.

Japanese International Space Weather Initiative officials

International Space Weather Initiative bureau members in Japan are Kiyohumi Yumoto of Kyushu University and Hajime Hayakawa of JAXA. The International Space Weather Initiative Newsletter Office (on behalf of the United Nations) is led by Kiyohumi Yumoto of Kyushu University, Publisher, and George Maeda of Kyushu University, Editor. The National Coordinator for Japan is Takahiro Obara of JAXA.

Current Japanese instruments (as of February 2010)

<i>Instrument</i>	<i>Lead scientist</i>	<i>Country</i>	<i>Objective</i>
Flare-monitoring telescopes under the Continuous H-alpha Imaging Network (CHAIN)	S. Ueno, K. Shibata, (Kyoto University)	Japan	Time variation and 3-D velocity field of solar activity, flares, filament eruptions and shock waves (Moreton waves) by using multi-wavelength H-alpha images of the full-disk Sun
Global Muon Detector Network (GMDN)	K. Munakata (Shinshu University)	Japan	To identify the precursory decrease of cosmic ray intensity that takes place more than one day prior to the Earth-arrival of shock driven by an interplanetary coronal mass ejection

<i>Instrument</i>	<i>Lead scientist</i>	<i>Country</i>	<i>Objective</i>
Magnetic Data Acquisition System (MAGDAS)	K. Yumoto (Kyushu University)	Japan	Study of dynamics of geospace plasma changes during magnetic storms and auroral substorms, the electromagnetic response of iono-magnetosphere to various solar wind changes, and the penetration and propagation mechanisms of DP2-ULF range disturbances
Optical Mesosphere Thermosphere Imagers (OMTIs)	K. Shiokawa (Nagoya University)	Japan	Dynamics of the upper atmosphere through nocturnal airglow emissions
South-East Asia Low-Latitude Ionosonde Network (SEALION)	T. Nagatsuma (NICT)	Japan	Monitoring and study of ionospheric disturbances in the equatorial region by ionospheric and geomagnetic field observations
Education and outreach activities on space weather	S. Watari (NICT)	Japan	Education and outreach activities under the International Space Environment Service

Slovakia

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[22 October 2010]

Institutions in Slovakia participate in the International Living with a Star programme (http://ilwsonline.org/ilws_organization.htm) and the International Space Weather Initiative programme (http://stara.suh.sk/id/iswi/iswi_SK-en.htm, 2010-2012). In past years Slovak institutes participated actively in the International Heliophysical Year (<http://ihy.saske.sk>) and the International Year of Astronomy (www.astronomy2009.org/organisation/nodes/national/view/SK) programmes.

An important step was the creation of the Space Research Centre on influences of space weather, in eastern Slovakia. The project was supported by European Union funds allocated by the Ministry of Education of Slovakia. Three institutes, namely, the Astronomical Institute of the Slovak Academy of Sciences, in Tatranská Lomnica (the main institution), the Institute of Experimental Physics of the Slovak Academy of Sciences, in Košice, and P. J. Šafárik University, also in Košice (the partner institutions), constituted the Centre. With the support of the European Union, experimental and computational bases for various ground-based and satellite measurements were planned to be updated, and new experiments would be established in the frame of international collaboration.

Space weather activities of the Slovak Central Observatory, in Hurbanovo, are focused on analysis of various forms of solar and space weather data (both ground-based and satellite data). Two sudden ionospheric disturbance monitors (<http://solar->