Item 11. Technical Presentation on "International Center for Space Weather Science and Education (ICSWSE) of Kyushu University"
Space Environment Research Center (SERC)  
April 2002 – March 2012

International Center for Space Weather Science and Education (ICSWSE)  
April 2012 -
Space Environment Research Center (SERC), Kyushu University, Established in 2002

Roles of SERC

- Creation of interdisciplinary geospace environment science
- Basic research of space weather forecast and space debris warning
Space Environment Research Center (SERC), Kyushu University, Established in 2002

Laboratories in the opening

Geospace Environment Observation Lab.

Geospace Experimental Simulation Lab.

Integrated Data Analysis Lab.

Geospace Hazard Simulation Lab.
Research activities in SERC

- Plasma obs. satellite
- Space debris-simulator
- Simulation of Auroral storm
- MAGDAS/CPMN
- The earth’s foreshock
- Plasma-vortex
- Helicon plasma generator
Space environment monitoring: Space debris

Debris observation and simulation

Kyushu-U. JAXA dust detectors with multi-sub-satellite observation system

http://ssdl.aero.kyushu-u.ac.jp/?SpaceDebris%2FOrbitalAnalysis

Courtesy of Prof. Hanada
Space environment monitoring: Geomagnetic field disturbances

MAGDAS/CPMN started in 2003
(MAGnetic Data Acquisition System/Circum pan Pacific Magnetometer Array)
International collaborations: MAGDAS

Cooperation with MAGDAS host countries

Installation • Maintenance • Operation of Network

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Autonomous association by MAGDAS host countries

08.2011 Africa MAGDAS Association

03.2011 Manila, Philippines, SERC sub-center
Participation to international space science projects

Contribution to the International Space Weather Science

ULTIMA (since 2006)
Chair of worldwide consortium of magnetic observational arrays

IHY (2007-2009)
Development of MAGDAS in the world

ISWI (2010-2012)
Contribution to the enlightenment of space weather science
Space weather science education

Space weather summary report

Since October 2002, daily reports on space weather have been issued by students.

Outreach activities on space weather

Over 50 public lectures on Space weather science for children and general citizen in Japan.

Foreign students from Asian/African nations

Six Ph D. students from 5 nations (2012) (Egypt, Sudan, Indonesia, Philippines, 2 from Malaysia)
An ISWI / MAGDAS School on Litho-Space Weather was held at Redeemer’s University, Mowe, Near Lagos, Nigeria, from 15 – 21 August, 2011.

To view presentation files, photographs, or other documents, click on the pdf links. Presentation Files of all talks delivered at this school are available.

**Day 1**
- **Arrival**
  - Opening Ceremony
  - Capacity Building (KY1)

**Day 2**
- **Arrival**
  - Principles of geomagnetism (AY1)
  - Geomagnetic disturbances (AY2)
- **Lunch**
  - African MAGDAS Station Status Reports (MG1)
- **Break**
  - Data analysis (MG2)
- **1st Morning Session**
  - MAGDAS data tutorial (MG3)
- **2nd Morning Session**
  - MAGDAS Deployment in Africa (MG4)

**Day 3**
- **Mohamed**
  - Principles of geomagnetism (AY1)
  - Geomagnetic disturbances (AY2)
- **Lunch**
  - Data analysis (MG2)
- **Break**
  - MAGDAS Deployment in Africa (MG4)
- **1st Afternoon Session**
  - MAGDAS data tutorial (MG3)
- **2nd Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)

**Day 4**
- **Arrival**
  - Analysis of satellite geomagnetic data (MG1)
  - Analysis of satellite geomagnetic data (MG2)
- **Lunch**
  - Data analysis (MG2)
- **Break**
  - MAGDAS Deployment in Africa (MG4)
- **1st Morning Session**
  - MAGDAS Deployment in Africa (MG4)
- **2nd Morning Session**
  - MAGDAS Deployment in Africa (MG4)

**Day 5**
- **Arrival**
  - Analysis of satellite geomagnetic data (MG1)
  - Analysis of satellite geomagnetic data (MG2)
- **Lunch**
  - Data analysis (MG2)
- **Break**
  - MAGDAS Deployment in Africa (MG4)
- **1st Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)
- **2nd Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)

**Day 6**
- **Arrival**
  - Analysis of satellite geomagnetic data (MG1)
  - Analysis of satellite geomagnetic data (MG2)
- **Lunch**
  - Data analysis (MG2)
- **Break**
  - MAGDAS Deployment in Africa (MG4)
- **1st Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)
- **2nd Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)

**Day 7**
- **Arrival**
  - Analysis of satellite geomagnetic data (MG1)
  - Analysis of satellite geomagnetic data (MG2)
- **Lunch**
  - Data analysis (MG2)
- **Break**
  - MAGDAS Deployment in Africa (MG4)
- **1st Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)
- **2nd Afternoon Session**
  - MAGDAS Deployment in Africa (MG4)

School Instructors:
KY= Prof. K. Yumoto; ABR= Dr. Rabiu; VD= Prof. Vafi D.; AY= Dr. A. Yoshikawa; MG= Dr. George M.; AI= Dr. A. Ikeda; SA= Dr. S. Abe; MG= Dr. Magdi of Sudan.

- A 264-page textbook entitled *Selected Papers of MAGDAS* was published prior to the School, containing MAGDAS-related papers that had been published in peer-reviewed journals.
- 60 participants, of whom 8 were instructors mainly from Kyushu University and the remaining participants from MAGDAS African host countries and Nigerian students.
ISWI/MAGDAS school

Future schools:
2012  Indonesia
2013  Côte d'Ivoire
2014  Japan

Sponsorship:
JSPS Core to Core Program –
the Asia-Africa Science Platform Program
From SERC to ICSWSE...

New focus of concern in space weather
  • Direct effects of solar activity
  • Long-term presence of humans in space

Request from the ISWI community to SERC
  • Abuja ISWI Resolution (Abuja, Nigeria 2011)

Re-organization of SERC to ICSWSE was decided:
  • Further development of space weather science
  • Establishment of the international center consistent with the goals of the ISWI
ICSWSE Agenda

- To provide the basic knowledge that will help humans work in space
- To create the foundations of Space Weather Study, Geospace Science and Space Terrestrial Study
- To explore the synergy of space science, space engineering, and space medicine
ICSWSE Activities

- Enlarge the scope of its space weather research
- Conduct more detailed investigation on the links between geospace changes, climate changes, and natural disasters
- Start new research in the biomedical aspects of geospace
- Evolve internationally as the Center for Space Weather Science and Education consistent with the Abuja International Space Weather Initiative resolution (A/AC.105/1018: IV)
Capacity building
1. Training on the instrumentation
2. Training on data analysis
2. Training on doing science with the data
Summary (1)

The new ICSWSE will conduct ISWI activity for young scientists in Japan and in the world through a wide-variety of approaches:
- Conducting overseas ISWI/MAGDAS Schools
- Implementing student exchanges
- Installing ground magnetometers (e.g. MAGDAS) in "missing areas"
- Bringing students who want to learn more about space weather science to Japanese universities.
- Growing a network of centres, focusing on space weather around the world, dedicated to the advancement of space weather research and education.
ICSWSE : “iku-sei” : 育成

- Research initiatives (e.g., collaboration with foreign researchers)
- Data-collection initiatives (e.g., the MAGDAS Project)
- Education initiatives (e.g., ISWI/MAGDAS Schools)

New center will contribute to Space Weather Capacity Building with cooperation of COPUOS and other space weather related institutes in the world.