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差出人　George Maeda

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* I S W I = International Space Weather Initiative *
* (www.iswi-secretariat.org) *
*
* Publisher: Professor K. Yumoto, SERC, Kyushu University, Japan *
* Editor-in-Chief: Mr. George Maeda, SERC (maeda[at]serc.kyushu-u.ac.jp)*
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Attachment(s):
(1) "Rabiu UN ISWI report Feb 2012", 760 KB pdf, 7 pages.
(2) "Report complete UN Nigeria ISWI", 1.8 MB, 133 pages.

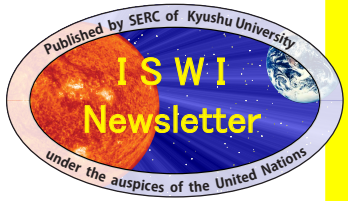
: Re:
: -2012 ISWI Steering Committee Meeting:
: Report on UN/Nigeria Workshop on ISWI
: -UN/Nigeria Workshop on ISWI:
: Full and final report.

Dear ISWI Participant:

I attach the presentation (the first pdf) from Prof. Rabiu during the recent ISWI Steering Committee meeting in Vienna.

I also attach the full and final report for UN/Nigeria Workshop on ISWI. It is the second attached pdf.

With kind regards,
: George Maeda
: The Editor
: ISWI Newsletter



This pdf circulated in
Volume 4, Number 24,
on 4 March 2012.

UN/NIGERIA WORKSHOP ON INTERNATIONAL SPACE WEATHER INITIATIVE ISWI

Babatunde Rabiu

NASRDA, Abuja, Nigeria

Email: tunderabiu@yahoo.com

INTERNATIONAL SPACE WEATHER INITIATIVE (ISWI) 2011

UN / NIGERIA WORKSHOP

October 17th - 21st, 2011, Abuja, Nigeria

VENUE

REIZ CONTINENTAL HOTEL
Central District. Abuja.
www.reizcontinentalhotel.com

International Scientific Organizing Committee

1.Amory-Mazuaudier, C., France
2.Chilingarian, A., Armenia
3.Cohen, M., USA
4.Davila, J. , USA
5.Georgieva, K, Bulgaria
6.Glover, A. EU
7.Gopalswamy, N., USA [Co-Chair]
8.Groves, K., USA
9.Gadimova S., United Nations [Co-Chair]
10.Mahrous, A., Egypt
11.Okeke P. N. NIGERIA [Co-Chair]
12.Potgieter, M., South Africa
13.Rabiu, A.B., NIGERIA [Co-Chair]
14.Raulin, J.-P., Brazil
15.Shibata, K., Japan
16.Wang, C., China
17.Yizengaw, E., USA
18.Yumoto, K., Japan

Local Organizing Committee

1. Ajayi B.
2.Asekhamen R. I.
3.Ayantunji B. G.
4.Chizea F.
5.Falayi, E. O.
6.Falodun S. E.
7.Haubold, H.J.Germany
8.Iheanacho A. A.
9.Inwelegbu J. O.
10.Mohammed S. O.
11.Obasuyi G.
12.Okeke F. N.
13.Okeke P. N. [Co-Chair]
14.Okere B. I.
15.Omalika K. C.
16.Omowa E.
17.Opara F. E.
18.Rabiu, A.B.,[Co-Chair]

Hosted by: Centre for Basic Space Science(CBSS)

Venue

- The workshop took place at the Reiz Continental Hotel , Plot 779,Cadastral Zone A0,Central District, Abuja, Nigeria. All meetings, seminars and poster presentation took place within various halls/rooms reserved within the hotel premises for convenience.

Accommodation

- International participants with UN/NASA/JAXA travel support were provided with accommodation within the venue of the Workshop; i.e., at Reiz Intercontinental hotel.
- International participants with support from SERC, Kyushu University, Japan lodged at the Royalton Hotel, Gongola Steet, Area 2, Garki, Abuja.
- Local (Nigerian participants) with full support were accommodated at the Harmonia Hotels, Plot 896, Gimbiya Street /3 Onitsha Crescent, Area 11 Garki, Abuja.

The **Programme**

- The opening was chaired by a distinguished senator of the Federal Republic of Nigeria and the chairman of the Senate Committee on Science and Technology, Professor Ajayi Robert Boroffice. The workshop was declared open by the Honorable Minister of Science and Technology of the Federal Republic of Nigeria, Professor Ita Ewa, who was represented by the Director of Information and Communication Technology ICT in the Ministry

- Thereafter other scientific activities followed

- One unique feature of the workshop was the video presentation of NASA scientists who could not make it physically to the meeting.

The **Programme**

- One hundred and four abstracts were accepted for the meeting. 31 were classified as oral presentation while the remaining 73 were presented as posters.

- The workshop was brought to a close on 21st October 2011 with a short closing session which featured presentation of awards to members of International Steering Committee of ISWI present at the meeting

- recognition of contributions of Professor Hans Haubold to the development of Basic Space Science in Nigeria and his declaration as the Moon of Nigeria.

Summary of Participation

- In all about 100 participants

1. Austria
2. Brazil
3. Bulgaria
4. Cote D'Ivore
5. Croatia
6. Democratic Republic Of Congo (DRC)
7. Ecuador
8. Egypt
9. Ethiopia
10. Ghana
11. India
12. Indonesia
13. Iraq
14. Japan
15. Niger
16. Nigeria
17. Peru
18. Slovakia
19. Turkey
20. Zambia

Sponsorship

- UNOOSA/ICG provided travel support and DSA for 12 participants from developing countries
- NASA provided travel support and DSA for 14 participants
- SERC, Kyushu University, Japan provided travel and lodging for 5 participants.
- Slovak Central Observatory, Hurbanovo, Slovakia and Centro De Radio Astronomia E Astrofisica,São Paulo, Brazil sponsored participation of one person each to the meeting. Other sponsors are IAU, COSPAR, JAXA
- Nigerian Government provided lodging and feeding for 25 participants from developing countries and 40 Nigerian participants.

UN/NIGERIA WORKSHOP ON INTERNATIONAL SPACE WEATHER INITIATIVE ISWI

ISWI Newsletter
Published by SERC of Kyushu University under the auspices of the United Nations

This pdf circulated in Volume 4, Number 24, on 4 March 2012.

Hosted by the Center for Basic Space Science (CBSS) of the National Space Research and Development Agency on behalf of the Government of the Federal Republic of Nigeria

(17-21 October 2011, Abuja, Nigeria)

Background of the Workshop

Initiated in 1990, the United Nations Basic Space Science Initiative has contributed to the international and regional development of astronomy and space science through annual workshops organized jointly by the United Nations, ESA, the National Aeronautics and Space Administration (NASA) and the Japan Aerospace Exploration Agency (JAXA) in the framework of the International Heliophysical Year 2007 and the International Space Weather Initiative (ISWI). The United Nations Basic Space Science Initiative has led to the establishment of planetariums, astronomical telescopes and International Heliophysical Year/International Space Weather Initiative instrument arrays worldwide, particularly in developing countries.

Between 2005 and 2009 the UN Workshops on Basic Space Science focussed on the highly successful International Heliophysical Year (IHY). These workshops were held in United Arab Emirates (2005), India (2006), Japan (2007), and Bulgaria (2008) and Korea (2009). A successor program to IHY is the International Space Weather Initiative (ISWI), which is envisioned to continue with the tradiation of worldwide distribution of space monitoring instrument arrays. Today, ISWI contributes to the observation of space weather through the deployment of instrument arrays and the sharing of observed data among researchers around the world. The first workshop on ISWI was held in Helwan, Egypt and hosted by the Helwan University, Egypt. This UN/Nigeria Workshop on ISWI has been endorsed by the United Nations General Assembly as part of the 2011 activities of the program of the United Nations Office for Outer Space Affairs. The next and third workshop in the series would be hosted by Ecuador in 2012.

The purpose of the UN/Nigeria Workshop was to continue the scientific study of universal processes in the solar system that affect space weather and the terrestrial environment, and to continue to coordinate the deployment and operation of new and existing instrument arrays aimed at understanding the impacts of Space Weather on Earth and the near-Earth environment. This workshop provided an excellent opportunity for potential instrument providers to engage collaborators from specific geographical locations, to broaden the coverage of existing instrument arrays, and to provide scientific background needed for analyzing the data and modeling the physical processes.

Venue

The workshop took place at the Reiz Continental Hotel , Plot 779,Cadastral Zone A0,Central District, Abuja, Nigeria. All meetings, seminars and poster presentation took place within various halls/rooms reserved within the hotel premises for convenience.

Accommodation:

International participants with UN/NASA/JAXA travel support were provided with accommodation within the venue of the Workshop; i.e., at Reiz Intercontinental hotel. International participants with support from SERC, Kyushu University, Japan lodged at the Royalton Hotel, Gongola Steet, Area 2, Garki, Abuja. Local (Nigerian participants) with full support were accommodated at the Harmonia Hotels, Plot 896, Gimbiya Street /3 Onitsha Crescent, Area 11 Garki, Abuja.

Arrival date: The arrival date was Sunday 16th October 2011 for all participants

The **Programme**

Detailed program is in Appendix 1. The opening was chaired by a distinguished senator of the Federal Republic of Nigeria and the chairman of the Senate Committee on Science and Technology, Professor Ajayi Robert Boroffice. The workshop was declared open by the Honorable Minister of Science and Technology of the Federal Republic of Nigeria, Professor Ita Ewa, who was represented by the Director of Information and Communication Technology ICT in the Ministry, Engineer L. K. Jimoh. Thereafter other scientific activities followed as indicated in the Appendix. One unique feature of the workshop was the video presentation of NASA scientists who could not make it physically to the meeting.

One hundred and four abstracts were accepted for the meeting. 31 were classified as oral presentation while the remaining 73 were presented as posters. Appendix 2 presents the compilation of abstracts.

The workshop was brought to a close on 21st October 2011 with a short closing session which featured presentation of awards to members of International Steering Committee of ISWI present at the meeting; as well as recognition of contributions of Professor Hans Haubold to the development of Basic Space Science in Nigeria and his declaration as the Moon of Nigeria.

Summary of Participation

In all about 100 participants from 20 Countries participated in the event. See the List of participants in Appendix 3. Appendix 4 displayed a collection of pix by George Maeda of Kyushu University.

Countries of participants

1. Austria
2. Brazil
3. Bulgaria
4. Cote D'Ivore
5. Croatia
6. Democratic Republic Of Congo (DRC)
7. Ecuador
8. Egypt
9. Ethiopia
10. Ghana
11. India
12. Indonesia
13. Iraq
14. Japan
15. Niger
16. Nigeria
17. Peru
18. Slovakia
19. Turkey
20. Zambia

Sponsorship

UNOOSA/ICG provided travel support and DSA for 12 participants from developing countries. NASA provided travel support and DSA for 14 participants. SERC, Kyushu University, Japan provided travel and lodging for 5 participants. Slovak Central Observatory, Hurbanovo, Slovakia and Centro De Radio Astronomia E Astrofisica,São Paulo, Brazil sponsored participation of one person each to the meeting. Other sponsors are IAU, COSPAR, JAXA

Nigerian Government provided lodging and feeding for 25 participants from developing countries and 40 Nigerian participants.

International Scientific Organizing Committee (ISOC)
Gopalswamy, N., USA [Co-Chair]
Gadimova, S., UN [Co-Chair]
Okeke P. N. Nigeria [Co-Chair]
Rabiu, A.B., Nigeria [Co-Chair]
Amory-Mazuadier, C., France
Chilingarian, A., Armenia
Cohen, M., USA
Davila, J. , USA
Georgieva, K, Bulgaria
Glover, A. EU
Groves, K., USA
Mahrous, A., Egypt
Potgieter, M., South Africa
Raulin, J.-P., Brazil
Shibata, K., Japan
Wang, C., China
Yumoto, K., Japan
Yizengaw, E., USA

Local Organizing Committee (LOC)
Okeke P. N. [Co-Chair]
Rabiu, A.B., [Co-Chair]
Mohammed S. O.
Haubold, H.J., Austria
Okeke F. N.
Falodun S. E.
Okere B. I.
Asekhamen R. I.
Opara F. E.
Chizea F.
Ajayi B.
Iheanacho A. A.
Inwelegbu J. O.
Omaliko K. C.
Obasuyi G.
Ayantunji B. G.
Falayi, E. O.

Web: www.iswinigeria.org.ng

Report Drafted by Babatunde Rabiu, National coordinator ISWI, Co-Chair ISOC

APPENDIX 1

UN/NIGERIA WORKSHOP ON INTERNATIONAL SPACE WEATHER INITIATIVE

Abuja, Nigeria, October 17 – 21 , 2011

Scientific Program

AGENDA – Day 1 (Monday)

Session 1: Opening **Session Chair: Senator (Professor) A. R. Boroffice**

(i) Opening Prayer – 10: 00am – 10: 04am
(ii) National Anthem - 10:04am – 10: 07am
(iii) Opening Remarks by Chairman – Senator (Professor) Ajayi Robert Boroffice 10:07am – 10: 10am
(iv) Welcome Address by the Director General NASRDA 10:10 -10:15am
(v) Brief remarks by Director of CBSS, Prof. P. N. Okeke 10: 15 – 10:20am
(vi) UNBSS, 1991 – 2012 Review by Hans Haubold 10: 20 – 10: 30am
(vii) Video welcome by J. Davila and Nat Gopalswamy 10:30 – 10:40am
(viii) Logistics by Babatunde Rabiu (Co-Chair) 10:40-45 am
(ix) Declaration of workshop Opened by the Hon. Minister of Science & Technology –10:45-10:55am
(x) Closing Prayer – 10:55 – 10:58am
(xi) National Anthem - 10:58 – 11:00am
(xii) Coffee Break 11:00 – 11:20am

Session 2: ISWI Tutorials **Chair: H. Haubold**

11:20-11:40	Solar Corona (video)	Joseph Davila
11:40-12:00	Solar Radio emission (video)	Nat Gopalswamy
12:00-12:20	Solar Dynamo and Solar Activity	Katya Georgieva
12:20-12:30	Discussion	
12:30 – 01:30	Lunch	

Session 3: ISWI Tutorials (Continued) **Chair: K. Georgieva**

1:30-1:50	Geospace Science	K. Yumoto
1:50-2:10	Ionosphere	B. Rabiu
2:10-2:30	Space Weather	A. Mahrous
2:30-3:00	Coffee Break	
3:00-3:30	Solar Dynamics Observatory (video)	Phil Chamberlin
3:30-4:00	Space Weather Modeling (video)	Yihua Zheng

4:00- 5:00 Poster Viewing

7:00 - 9:00 Opening Dinner

AGENDA – Day 2 (Tuesday)

Session 4: ISWI Instrument Overviews Chair: **B. Rabiu**

9:00-9:30	MAGDAS	K. Yumoto
9:30-10:00	SAVNET	F. Bertoni
10:00-10:30	African GPS	C. Mazaudier/K. O. Obru
10:30-10:50	Coffee Break	

Session 5: ISWI Instrument Overviews **Chair: K. Yumoto**

10:50-11:20	FMT-CHAIN	S. UeNo
11:20-11:50	SEVAN	D. Maricic
11:50-12:30	Discussion on Future of the Instrument program	
12:20-1:30	Lunch	

Session 6: ISWI Instrument Teams **chair: Instrument PIs**

2:00-4:00	Team meetings (parallel)	Team leaders
4:30-4:15	Coffee Break	

Session 7: ISWI Instrument Teams

4:15-5:30	Team meetings (parallel)	Team leaders

Session 8: Posters

5:30-6:30 Posters

AGENDA – Day 3 (Wednesday)

Session 9: Field Trip

National Space Research and Development Agency NASRDA headquarters, Abuja;

National Museum Abuja; and Abuja Craft Village.

AGENDA – Day 4 (Thursday)

Session 10: Science Results **chair: P. Okeke**

9:00-9:30 International Committee on GNSS (ICG) S. Gadimova and H. Haubold

9:30-9:50 Determination of the Best-Fit Tropospheric Delay Model on the Nigerian Permanent GNSS Network (Nignet) J.D. Dodo

9:50-10:10 TEC derived from Some GPS Stations in Nigeria & Comparison with the IRI R.B. Abdulrahim

10:10-10:30 Analyzing Absorption of Sunlight By Mineral Dusts R. Salihu Sa'id

10:30-10:50 The Response of Interplanetary Medium to The Geomagnetic Storm Of April 2010

R. O. Salami

10:50-11:10 Low Level Jet Wind Shear At Niamey At Bamako M. Saidou

11:10-11:30 Coffee Break

Session 11: Science Results **chair: K. Yumoto**

11:30-11:50 Space Weather Investigation Based on HF Propagation S.E. Tulunay and Y. Tulunay

11:50 -12:10 Seasonal Variability Of Solar Quiet Daily (Sq) Variation in Geomagnetic Elements at Low Latitudes O.R. Bello

12:10-12:30 Cosmic Ray Radiations & Solar Minimum: Response to Earth's Atmosphere

E.A. Hanson, F.N. Okeke and E.C. Okoro

12:30 – 1:30 Lunch

Session 12: Science Results

1:30-1:50 Signature of Midnight Temperature Maximum (MTM) Using TEC (GPS) and OI630 Nm Night Airglow S. D. Jaypal

1:50-2:10 Solar Radiation and Longwave Radiative Climatology R. Al-Nuaimi

2:10-2:30 Electron Density Distribution Over Equatorial Ionosphere E T Desta

2:30-2:50 Chain-Project: Investigations of Solar Active Phenomena D. P. Cabezas

2:50-3:50 Deliberation on paper from SERC, Kyushu University

3:50-4:20 Coffee Break

Session 13: Extended Poster Session (All authors Present at their Posters)

4:20-6:30 Poster session

AGENDA – Day 5 (Friday)

Session 14: New Initiatives and National Efforts **chair: K. Yumoto**

9:00-9:25 Space Science & Technology in Ghana N.A.K. Browne

9:25- 9:50 Space Science at the University of Zambia H. Mweene

9:50-10:15 Space Science in Democratic Republic of Congo B. M. Kahindo

10:15-10:40 From IHY to ISWI A.B. Rabiu

10:40-11:00 Coffee Break

11:00-11:20 Geomagnetism and Solar Physics in Peru J. Ishitsuka

11:20-11:40 Initial Results from Awesome VLF Receiver in Ecuador E.D. Lopez

11:40-12:00 International Collaboration and Academic Exchange of the Chain Project S. Ueno

Session 15: Closing session chair: **S. Gadimova**

2:00-2:30 Regional Centers for Space Science and Technology Education S. Gadimova & H. Haubold

2:30-3:00 Discussion on International Center of Space Weather Sciences K. Yumoto

3:00 Conclusion H. Haubold

1:00 – 2:00 Lunch

7:00 – 9:00 Closing Dinner

Annexure I: Plan for MAGDAS Session
UN/Nigeria Workshop on ISWI

Conference Time for ISWI Instrument Teams
Day 2 (18 Oct. 2011) Sessions 6 and 7 (2PM to 5:30PM)

Chair: K. Yumoto; G. Maeda

Time	**Speaker**	**Talk**
2:00 - 2:3	K. Yumoto (Japan)	Problems and Solutions; Future Plans for MAGDAS.
2:30 - 2:45	G. Maeda (Japan)	Current State of MAGDAS in Africa and the Rest of the World (57 stations)
2:45 - 3:00	ABU Rep (Nigeria)	Status of Abuja Station
3:00 - 3:15	ILR Rep (Nigeria)	Status of Ilorin Station
3:15 - 3:30	LAG Rep (Nigeria)	Status of Lagos Station
3:30 - 3:45	Mweene (Zambia)	Status of Lusaka Station
3:45 – 4:15	Coffee Break	
4:15 - 4:30	Ishitsuka (Peru)	Status of Peru Stations (2 stations)
4:30 - 4:45	Sugon (Philippines)	Status of Philippine Stations (6 stations)
4:45 - 5:00	Harry B. (Indonesia)	Status of Indonesia Stations (7 stations)
5:00 - 5:30	Discussion time: Air your views.	

ABSTRACTS

UN/Nigeria Workshop on International Space Weather Initiative ISWI

17-21 October 2011

Abuja, Nigeria

PAPERS SCHEDULED FOR ORAL PRESENTATION

TEC DERIVED FROM SOME GPS STATIONS IN NIGERIA AND COMPARISON WITH THE IRI

[1,2]A.B. Rabiu, [3]K. Groves, [1,4]**R.B. Abdulrahim**, [2]R.S. Fayose
[5]J.O. Adeniyi, [6]E.A. Ariyibi, [7]E.O. Oyeyemi and [8]B.I. Okere
[1]National Space Research & Development Agency, NASRDA, Abuja, Nigeria
[2]Space Physics Laboratory, Federal University of Technology, Akure, Nigeria
[3]Space Weather Centre of Excellence, AFRL/VSBXI, USA
[4]Centre for Satellite Technology, NASRDA, Abuja, Nigeria
[5]Department of Physics, University of Ilorin, Ilorin, Nigeria
[6]Department of Physics, Obafemi Awolowo University, Ile-Ife, Nigeria
[7]Department of Physics, University of Lagos, Lagos, Nigeria
[8]Centre for Basic Space Science, NASRDA, Nsukka, Nigeria

Abstract: Total electron content (TEC) measured simultaneously using Global Positioning System (GPS) satellites at some locations in Nigeria during 2008-2010 was used to study the diurnal, seasonal, and annual TEC variations. The TEC exhibits features like the equatorial noon time bite-out, annual and semiannual variations, the equatorial ionization anomaly, and day-to-day variability. Daytime variability is compared with nighttime variability at all stations. The time of occurrence of the diurnal maximum in TEC also varies with season. Measured TEC were compared with those predicted by the International Reference Ionosphere (IRI). It was observed that IRI TEC is not in accord with those measured at about all local times.

Keywords: Ionosphere; GPS; Total electron content; IRI; Equatorial and low latitude ionosphere.

SOLAR RADIATION AND LONGWAVE RADIATIVE CLIMATOLOGY FOR SELECTED STATIONS IN IRAQ

R. Al-Nuaimi
Department of Atmospheric Sciences
College of Science, Al-Mustansiriyah University
Baghdad, Iraq

Abstract: The aim of this research is to analyze solar isolation at the top of the atmosphere, the insolation at the Erath surface, the clear sky insolation, and the downward longwave radiative flux over Iraq.

MALAYSIA APPROACH ON ISWI PROGRAMME ABSTRACT

Mhd.F. Asillam
National Space Agency of Malaysia
Level 8, PjH Commercial Building, Persiaran Perdana
Presinct 4, 62100 Putrajaya, Mayalaysia

Abstract: Malaysia had performed the ISWI Working Committee of Malaysia on 20th July 2010. The theme of ISWI initiative in Malaysia is 'Space weather for knowledge generation and services towards societal well-being ' . The educational and awareness programme on space weather has been proposed to be included in the current National Planetarium's programme. The general proposed idea was to promote and share the current data, instruments and researches regarding space weather using the platform ISWI and also for Malaysia to join in the ISWI instrument programme. With the Langkawi National Observatory (LNO) at Pulau Langkawi, Kedah (Long: 99d 46m 52s E , Lat: 06d 18m 25s N) which is housing a several telescope which are robotic apochromatic refractor (diameter 15 cm) for solar observation purpose, the continuous of solar activity can be observe (sunspot and flare). The telescope set be used for solar observation mainly in three different wavelengths simultaneously ; the continuum, H-alpha and Calcium K-line. With this existing facilities at LNO, we hope can contribute our own data to the international parties and the same time expert from international can co-working with us to strengthen our human capital. This paper also shown the interest and the national interest expert to participate. With this kind of arrangement, we hope can host some instrument and develop a good local programme and at the same time participate in the international research programme.

CURRENT STATE OF MAGDAS IN INDONESIA AND IT`S APPLICATIONS : MAGDAS

H. Bangkit
Space Science Center
LAPAN
Bangung 40173, Indonesia

Abstract: MAGDAS has been installed since 2005 at three sites in Indonesia. To support near real time data transfer as well as near real-time magnetic observation recently we developed a new data transfer system to increase reliability of our data transfer system. The new system is using an embedded controller and a router mobile cellular network to replace PC/Laptop and GSM modem in our old system, respectively. The data is transferred continuously to our server. We also setup another server as backup when our main server down. To monitor performance of the data transfer system we developed a near real-time data quick look at Space Science Center (LAPAN). In other hand, MAGDAS in Indonesia have a great contribution on the study of coupling of solar wind – magnetosphere – ionosphere. In this case we study about local geomagnetic disturbances, continuous (Pc3 and Pc5) and irregular (Pi2) magnetic pulsations. We will show our results on the study of (i) characteristics of Pi2 magnetic pulsation, (ii) relationship between Pc3 and velocity of solar wind and (iii) relationship of Pc5 with solar wind pressure, magnetic storm and magnetospheric substorm. (iv) Study on ULF anomalies that related to earthquake also performed. Data processing system to support LAPAN's Space Weather Program currently still developing based-on parallel computation to replace our old system. The output of data processing is displayed in our website**.**

SEASONAL VARIABILITY OF SOLAR QUIET DAILY (SQ) VARIATION IN GEOMAGNETIC ELEMENTS AT LOW LATITUDES

[1]O.R. Bello, [1,2]A.B. Rabiu, [3]K. Yumoto and [3]MAGDAS/CPMN Group
[1]Space Physics Laboratory, Federal University of Technology Akure (FUTA)
PMB 704, Akure, Ondo State, Nigeria
[2]National Space Research & Development Agency, NASRDA, Abuja, Nigeria
[3]Space Environment Research Centre, Kyushu University, Fukuoka, Japan

Abstract: Data set from three geomagnetic observatories (Khartoum, Addis Ababa and Nairobi) located along the East African meridian and managed by Space Environment Research Centre (SERC) has been used to carry out extensive studies on the seasonal variability of Sq in horizontal H, declination D and vertical Z intensity. Twelve months data of carefully selected quiet days between September 2008 and August 2009 were used in the analysis. Seasonal variability was found to exist in all magnetic elements with equinoctial maximum and D-season minimum in H field. The observed Sq in both D and Z field has maximum amplitude in J-season and minimum during September equinox. Results of correlation coefficient shows strong and positive correlation value between the same elements at different seasons. Poor correlation exists between H field and other elements at all seasons but D and Z are well correlated in some seasons. Different levels of interrelationship exist among geomagnetic elements at different seasons. Seasonal redistribution of ionospheric currents and shift in the relative position of Sq focus are suggested to be responsible for the observed Sq variations.

IONOGRAM INTERPRETATION VIA RAY TRACING THROUGH HYPOTHETICAL ELECTRON DENSITY PROFILES

C.D. Bennett
Physics Department
Ateneo de Manila University
Katipunan Avenue Loyola Heights, Quezon City, Metro Manila
The Philippines

Abstract: We wrote a program for simulating smooth electron density profiles by defining different ionospheric layers, their real heights and electron counts of the electron density peaks and troughs. We set the maximum height of the ionosphere to 1500 km and used variable height increments. For each particular radiowave pulse, we determine the height at which reflection occurs and the total time to reach that height using ray tracing, assuming that the ionosphere is nearly horizontal above the Philippines, using the known equation for the refractive index for each layer as function of electron density and radar frequency. The total time to reach that height is then multiplied by the speed of light in order to obtain the virtual height. The virtual height vs radar frequency is then plotted in order to simulate the corresponding ionogram. By manipulating the electron density profile, we were able to make a database of ionograms. We then tried to find a good match to the ionogram data of the FMCW (Frequency Modulated Continous Wave) radar in the Space Environment Research Center (SERC) Subcenter at Manila Observatory. Once the good match is found, we noted the corresponding electron density profile. We plotted the electron density profile in gray scale as a function of time for one day data at 30 minute intervals, in order to visually determine how the ionospheric layers merge and split.

NEW INPUTS AND INSIGHTS FROM RESULTS OBTAINED BY SAVNET

Bertoni, F. C. P., Raulin, J.-P.
Centro de Radio Astronomia e Astrofísica Mackenzie (CRAAM), Escola de Engenharia,
Universidade Presbiteriana Mackenzie, São Paulo, Brazil.

Abstract: SAVNET (South America VLF NETwork) is an international project coordinated by CRAAM (Centro de Radio Astronomia e Astrofísica Mackenzie), in Brazil, in cooperation with Peru and Argentina. The SAVNET project has been involved in the IHY activities (2004-2009) and since then in the International Space Weather Initiative (ISWI) program. It is a continuous effort to produce, contribute to and diffuse scientific knowledge on subjects related to Space and Atmospheric Geophysics, Solar Physics, Radio Sciences, among others, in general, Space Weather studies. We have extended the network towards the northern hemisphere with a new receiver station operating in Mexico. Because of its proximity to VLF transmitters, this new configuration will provide higher signal strength, as well as a larger spatial coverage. Therefore, the probability of detecting very high energetic flares from remote astronomical objects with SAVNET will increase. Finally, the new configuration is particularly well suited for studies related to ionospheric perturbations prior to earthquakes. In this talk, we summarize relevant results already obtained with the SAVNET in several scientific areas, as well as present studies currently in progress and future perspectives.

SPACE SCIENCE AND TECHNOLOGY IN GHANA

N.A.K. Browne
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Abstract: Emerging initiatives The presentation will outline the many efforts made in Ghana to establish a Space Science and Technology Centre. Plans are far advanced to establish a Space Science and Technology Centre in Ghana to enhance the country's capacity in astronomy and astrophysics. Efforts in the country towards this establishment include the Ministry of science and technology requesting a local telecommunication provider to convert its Satellite Earth Station into a Radio Astronomy Telescope. This will be used to start training astronomers and astrophysicists as well as providing research facility in the field. Other efforts include concern groups creating the awareness of the importance of the space science and creation of space clubs in schools through outreach programmes.

CHAIN-PROJECT: INVESTIGATIONS OF SOLAR ACTIVE PHENOMENA OBTAINED WITH THE FLARE MONITORING TELESCOPE (FMT)

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Abstract: The Flare Monitoring Telescope (FMT), was installed at Ica University in March of 2010 as part of CHAIN-Project (Continuous H-Alpha Imaging Network), initiating thus the world-wide observational network with solar telescopes, to make continuous observations (24-hour) of solar events. The FMT provide us simultaneously full-disk Sun images at different wavelength around the H-alpha absorption line. In this work, we would like to present some advances, analyzes and preliminary results of solar active phenomena obtained with Flare Monitoring Telescope in the Solar Station of Ica University.

THE SOLAR DYNAMICS OBSERVATORY AND ITS CONTRIBUTIONS TO SPACE WEATHER

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Abstract: The Solar Dynamics Observatory (SDO) was launched on 11 February 2010 and has worked flawlessly in its first year and a half of operation. SDO was the first mission launched for NASA's Living With a Star Program (LWS), so its focus is not only studying the causes and drivers of the variable Sun, but also how these variations force similar changes in the Earth and other objects within the Heliosphere. Due to SDO's many Space Weather goals, this presentation will not only show some of the recent, groundbreaking new results provided by SDO, but also focus on the real-time Space Weather advances provided by this spacecraft. A main theme throughout this talk will be methods and tools that researchers around the world can utilize to access and manipulate the SDO data real-time for both fundamental science and Space Weather monitoring purposes.

ELECTRON DENSITY DISTRIBUTION OVER EQUATORIAL IONOSPHERE: ASSIMILATION OF GPS OBSERVATION INTO NEQUICK MODEL

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Abstract: The technique relies on the knowledge of the model driving parameter Az (effective ionization level) for some equatorial regions GPS stations.We define sTEC as function of Az which is monotonic and then we assimilate GPS drived sTEC data of some Equatorial ground stations which are tracking at least 10 GPS satellites that determine 10 experimental slant TEC data from each station at a given epoch , into NeQuick model by optimizing NeQuick model using effective ionization level (AZ) so that the root mean square of the sTEC mismodelling between measured sTEC and modeled sTEC is minimized by a method called least square curve fitting .Using NeQuick drived by the Az for each UT and stations , all modeled slant TEC are calculated and statistical analysis between experimental and reconstructed slant TEC values along equator with seasonal as well as geomagnetic variations are presented .

DETERMINATION OF THE BEST-FIT TROPOSPHERIC DELAY MODEL ON THE NIGERIAN PERMANENT GNSS NETWORK (NIGNET)

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Abstract: The most dominant spatially correlated bias in satellite-based positioning is the atmospheric effects on the GNSS signals caused by the troposphere. The troposphere is the lower part of the atmosphere close to the earth surface; it is considered as a neutral atmosphere, with an index of refraction that varies with altitude. The variability of refractive index causes an excess group delay of the GPS signal thereby resulting to variation in GPS positioning; and is a matter of great concern to the geodetic community in terms of high accuracy applications. Compensation for the tropospheric bias is often carried out using a standard tropospheric model. In order to determine the best-fit tropospheric delay model for the Nigerian Permanent GNSS Network (NigNet), GNSS data collected from the NigNet were modelled using different global tropospheric delay models. This paper compares the results derived from the use of three different standard tropospheric models, namely the Saastamoinen model, Hopfield model and Neil model. The results are very useful to enhance the effectiveness and reliability of the tropospheric delay resolution process for regional GPS network users. Similarly, the result provides the best global tropospheric delay model for the NigNet.

Key words: Tropospheric delay, Hopfield model, Saastamoinen model, Neil model, NigNet.

RADIO EMISSIONS FROM THE SUN

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Abstract: Radio emissions from the Sun in the dm to m wavelengths are a signature of energetic phenomena. In this talk I will make a short review on the relation of these emission with observed phenomena such as flares, CMEs, and coronal shock waves. I will discuss on these remote electron signatures relate to phenomena seen at 1 AU and their relevance to space weather studies.

UNITED NATIONS BASIC SPACE SCIENCE INITIATIVE (1991-2012)

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Abstract: The United Nations Basic Space Science Initiative (UBSSI) is a long-term effort for the development of astronomy and space science through regional and international cooperation. It covers an active transfer of technology and knowledge, and the role of education on a worldwide basis, particularly in developing nations. To address the status of astronomy in Asia and the Pacific, Latin America and the Caribbean, Africa, and Western Asia, a series of workshops on Basic Space Science (BSS) was carried out between 1991 and 2004 in the following countries: India (1991), Costa Rica and Colombia (1992), Nigeria (1993), Egypt (1994), Sri Lanka (1995), Germany (1996), Honduras (1997), Jordan (1999), France (2000), Mauritius (2001), Argentina (2002), and China (2004). Detailed information is available at (http://neutrino.aquaphoenix.com/un-esa/). In line with one of the major recommendations emanating from these workshops, the establishment of astronomical facilities in developing nations for research and education programmes at the university level was initiated.
Pursuant to resolutions of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and its Scientific and Technical Subcommittee, since 2005, these workshops focused on the International Heliophysical Year (IHY) 2007 and took place in the following countries: the United Arab Emirates (2005), India (2006, Japan (2007), Bulgaria (2008), Ro Korea (2009). More detailed information can be obtained from the website of the United Nations Office for Outer Space Affairs (UNOOSA) at:
(http://www.unoosa.org/oosa/SAP/bss/ihy2007/index.html).
After deliberations at the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), beginning in 2010, the workshops focus on the International Space Weather Initiative (ISWI) as part of its three-year work plan. Detailed information is available at http://www.stil.bas.bg/ISWI/ . Workshops on the ISWI have been scheduled to be hosted by Egypt (2010) for the benefit of developing countries in Western Asia, Nigeria (2011) for Africa, and Ecuador (2012) for Latin America and the Caribbean. Currently, 14 IHY/ISWI instrument arrays with more than 600 instruments are operational in 95 countries.
In addition, to aid the global navigation satellite systems (GNSS) users community in dealing with the effects of space weather and ionospheric disturbances on GNSS performance, ISWI is supported by the programme on GNSS applications implemented by UNOOSA in its capacity as the Executive Secretariat of the International Committee on GNSS (ICG). ICG is contributing to and co-sponsoring several of the ISWI activities. Detailed information is available at the ICG Information portal at http://www.icgsecretariat.org.

SOLAR DYNAMO AND LONG-TERM VARIATIONS IN SOLAR ACTIVITY

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Abstract: Solar activity is due to the action of the solar dynamo which, according to the solar dynamo theory, transforms the toroidal component of the solar magnetic field into poloidal component and this poloidal component back into toroidal component, similar to the oscillation between kinetic and potential energies in a simple harmonic oscillator. In this talk the operation of the solar dynamo will be explained, the derivation of the long-term variations in its key parameters will be described, and the resulting variations in solar activity will be demonstrated. Finally, it will be shown how long-term variations in solar dynamo parameters influence the long-term variations in the way the Sun affects various terrestrial processes.

COSMIC RAY RADIATIONS AND SOLAR MINIMUM: RESPONSE TO EARTH'S ATMOSPHERE

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Abstract: Cosmic ray data (2007 – 2010) obtained from Athens Neutron Monitor Database was deployed for analysis in this work, in efforts to see its response to solar intensity as it propagates through Earth's atmosphere. Lower timescales do not reveal categorically, plausible relationship between propagation of cosmic rays and solar intensity. Nonetheless, increased cosmic rays during the early hours of the day when the Sun is not at the horizon, and a somewhat decrease in cosmic rays at both noon and post-noon hours. On larger time scales, increased cosmic ray intensities are observed in solar minimum years. The increased penetration of cosmic rays into Earth's atmosphere results from the reduced amount of charged particles produced by the Sun. Consequently, the magnetosphere becomes weak and very thin and could not offer the required maximum shielding effect on Earth.

SOLAR WIND TURBULENCE

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GEOMAGNETISM AND SOLAR PHYSICS IN PERU

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Abstract: We first hosted CPMN magnetometers at our Ancon Observatory, in 2007 arrived MAGDAS and replaced CPMN equipments and works fine. Recently we installed a MAGDAS II in a new place, a Solar Observatory made together with the Ica National University. Since March of 2010 we installed the Flare Monitor Telescope (FMT) sent from Hida Observatory of Kyoto University. Students from Ica National University are involved on observations and data reduction of solar observations, would be interesting involve students with geomagnetic data.

SIGNATURE OF MIDNIGHT TEMPERATURE MAXIMUM (MTM) USING TEC (GPS) AND OI630 NM NIGHT AIRGLOW

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Abstract: Night airglow data of Kolhapur station and GPS data of Hyderabad and Bangalore station have been used to obtain OI 630.0 nm intensity emission and d (TEC)/dT values respectively in order to monitor the ionospheric behavior in the Indian region. For this task, we are using the Tilting Photometers and Don Thompson's slant TEC software (rd_rinex) which gives OI 630.0 nm intensity emission and vertical TEC above each station respectively. The nocturnal variations observed in the atomic oxygen airglow emission at low latitude are well correlated with the dynamical variations seen in the F-region ionospheric parameters such as d(TEC)/dT, for both quiet and disturbed days.

The signature of midnight temperature maximum (MTM) has been observed in some of the nights in both OI630.0 nm and d (TEC)/dT data. The signature of MTM has been found in both night airglow (OI630.0 nm) and TEC data. It is suggested that F-region temperature should be simultaneously measured both at equator as well as at Kolhapur to confirm the signature of MTM.

INITIAL RESULTS FROM AWESOME VLF RECEIVER INSTALLED IN ECUADOR

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Abstract: In this work we present the first results that we have derived from analysis of data obtained using the Atmospheric Weather Electromagnetic System for Observation Modeling and Education (Awesome) VLF receiver, designed and developed by Stanford University, USA. The receiver was installed under inter-institutional cooperation in the emerging Space Science division of the Quito Astronomical Observatory, and it is working properly since 2010. We have describe the performance characteristic of the Awesome system and the importance of having receivers at equator for monitoring the ionosphere and magnetosphere, receipting extremely low frequencies (ELF;30-3000 Hz) and very low frequencies (VLF; 3-30 KHz) electromagnetic waves, in order to better understanding the physical processes which take place in these media.

CHAIN-PROJECT: OPERATION, OBSERVATION AND EDUCATION WITH THE FLARE MONITORING TELESCOPE (FMT) AT ESTACION SOLAR DE ICA (ESI) IN PERU

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Abstract: The Universidad Nacional San Luis Gonzaga de Ica has built a Solar Observatory in cooperation with Geophysical Institute of Peru and National Astronomical Observatory of Japan. At the Solar Station is installed the FMT (Flare Monitoring Telescope) from Hida Observatory of Kyoto University. The FMT installed outside Japan as part of CHAIN project, the FMT was installed in the Solar Station in March 2010. The target of the FMT is to monitor solar flares and erupting filaments continuously all over the solar disk and to investigate the correlation between the characteristics of the erupting phenomena and the corresponding CMEs. This equipment supports the development of Astronomical Science in Peru, also contributes worldwide sciences. The development of the basic sciences will be guaranteed when the university students, teachers and researchers work together. The FMT in the Solar Station will be useful for the study at different levels of university education.

PAST AND FUTURE DEVELOPMENTS IN SPACE SCIENCE AT THE UNIVERSITY OF ZAMBIA

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Abstract: The Department of Physics at the University of Zambia is in the process of introducing Space Science as a sub-discipline. This development was initially kick-started by the involvement of the department in the National Astronomy and Space Science Programme based at the University of Cape Town in South Africa, to which students from surrounding countries are admitted. The sitting of a MAGDAS instrument at the University of Zambia gave further impetus to the interest of the Department of Physics in Space Science. Now two courses in Space Science are being prepared for introduction into the undergraduate syllabus. In this talk, we shall give details of these developments and of our hopes for the future of Space Science in the country.

FROM THE INTERNATIONAL HELIOPHYSICAL YEAR TO INTERNATIONAL SPACE WEATHER INITIATIVE

[1,2]Rabiu, A.B., [3]Yumoto, K. [1]Bello, O.R. [1,4]Oluyo, K.S. and [3]MAGDAS Group

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Abstract: The Space Environment Research Centre of Kyushu University, Japan, installed 14 units of Magnetic Data Acquisition Systems MAGDAS over Africa. Magnetic records from these 14 stations have been employed in various research efforts to obtained interesting results hitherto unknown. Temporal and continental-spatial variation of Solar quiet daily Sq variation in the three geomagnetic field components H, D and Z have been investigated. H field experienced more variation within the equatorial electrojet zone. Day-to-day variability of Sq in H was examined. Twenty four (24) points analysis of numerical harmonic theory is applied to Sq in H, D and Z geomagnetic components in order to extract the amplitudes and the phase angles. A set of normalized percentage harmonics projects the influence of the contributions of each harmonic and the phase angles picture relative timing of their influence. Signature of the Equatorial electrojet over the African sector was identified and examined. The EEJ appear stronger in East than West Africa. Flow gradient do not follow a definite diurnal pattern. There is clear indication that equatorial ionosphere exhibits longitudinal variability. There exists variation in electromagnetic inductive from one station to another. A call is made for continuous deployment of magnetometers in Africa.

LOW LEVEL JET WIND SHEAR AT NIAMEY AT BAMAKO

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Niamey, Niger

Abstract: The wind shear between two levels is the difference between the two horizontal wind vectors. Shears occurring near the ground can be due to low level jets. Wind shears are known to disturb air properties around airplanes by generating sudden disturbance of the relative wind speed or by producing turbulence.
In the Sahel lower troposphere, a vertical wind shear also appears between the monsoon layer and the Harmattan layer. If the wind shear intensity is important in this area, they therefore constitute major risks during take-off and landing.

THE RESPONSE OF INTERPLANETARY MEDIUM TO THE GEOMAGNETIC STORM OF APRIL 2010

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Abstract: Knowledge of the activities within our own solar system is of fundamental importance in our attempts to understand the processes that occur in the upper reaches of our atmosphere; because, space weather is greatly influenced by the speed and density of solar wind and Interplanetary Magnetic Field (IMF) carried by solar wind plasma. For this reason, behaviours of the interplanetary medium and the heliosphere during the storm of 5-7 April 2010 were examined using the routinely observed values of southward component of the Interplanetary Magnetic Field, B_z, Storm Time Disturbance Index, D_{st}, Solar Wind Speed. Data of H and Z components of the earth's magnetic field recorded at some equatorial and polar stations were also considered to investigate ionospheric response to the storm. Strong solar wind hit the Earth's magnetosphere about 0800UT on 5 April 2010 and sparked first geomagnetic storm of the new solar cycle. The storm was the largest geomagnetic storm of the Sun caused in the past three years. The commencement, main phase, and recovery phase of the storm were discussed vis-à-vis the response of the interplanetary medium. Probable magnetic processes responsible for the storm as well as the ionospheric implications were also highlighted.

ANALYSING ABSORPTION OF SUNLIGHT BY MINERAL DUSTS FROM GROUND-BASED MEASUREMENTS

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Abstract: Satellite measurements of dust absorption of solar radiation are usually complemented by ground-based measurements from sun photometers. This method helps to ensure accuracy of the in situ measurements in conjunction with the satellite spectral measurements. Here we present mineral dust absorption measurements as retrieved from the sun photometer of the Aerosol Robotic Network located at Ilorin, Nigeria.

SPACE WEATHER INVESTIGATION BASED ON HF PROPAGATION SPACE WEATHER

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Department of Electrical and Electronic Engineering
Middle East Technical University ODTU/METU
Ankara, Turkey

Abstract: will be represented by geomagnetic disturbance indices. The effect of storms on HF propagation will be investigated.

INTERNATIONAL COLLABORATION AND ACADEMIC EXCHANGE OF THE CHAIN PROJECT IN RECENT ONE YEAR

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Kwasan & Hide Observatory
Kyoto University
Hida Observatory, Kurabashira, Makitakara
Takayama, Gifu 506-1314, Japan

Abstract: The short description: I will introduce contents of international collaboration and academic exchange of the CHAIN project in recent one year, such as personnel training in Peru, holding scientific workshops in Peru and Japan and technical supports of instruments or data-archives to Saudi Arabia, China etc.

SPACE WEATHER IN CHINA

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National Satellite Meteorological Center
China Meteorological Adminstration
Zhongguancun Nandajie 46, Beijing, China

Abstract: The resources and activities related to space weather in China will be introduced in this talk. Particularly, the space weather operation in China will be emphazed.

SCIENTIFIC RESULTS OBTAINED FROM MAGDAS/CPMN PROJECT

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Abstract: The Space Environment Research Center (SERC), Kyushu University has deployed the MAGnetic Data Acqusition System (MAGDAS) at 54 stations along the 210- and 96-degree magnetic meridians (MM) and the magnetic Dip equator, and three FM-CW radars along the 210^{o} MM during the International Heliophysical Year (IHY; 2005-2009) and the International Space Weather Initiative (ISWI; 2010-2012) (see http://magdas.serc.kyushu-u.ac.jp/ and http://magdas2.serc.kyushu-u.ac.jp/). The goal of MAGDAS project is to become the most comprehensive ground-based monitoring system of the earth\\\'s magnetic field. It does not compete with space-based observation. Rather, this ground-based network complements observation from space. To properly study solar-terrestrial events, data from both are required.

NASA/GSFC SPACE WEATHER SERVICES ENABLED BY CCMC

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Abstract: By combining forefront space weather science and models, employing an innovative and configurable dissemination system (iSWA.gsfc.nasa.gov), taking advantage of scientific expertise -- both in-house and from the broader community -- as well as fostering and actively participating in multilateral collaborations both nationally and internationally, GSFC space weather services, as a sibling organization to the Community Coordinated Modeling Center, is poised to address NASA's space weather needs (and needs of various partners) and to help enhancing space weather forecasting capabilities globally and collectively. With a large number of state-of-the-art physics-based models running in real-time covering the whole space weather domain, it offers predictive capabilities and a comprehensive view of space weather events throughout the solar system. In this paper, we will provide an overview of our service products/capabilities. In particular, we will take the series of CMEs occurred during the 2 - 4 August 2011 as an example to illustrate how we can use the iSWA system to track them in the interplanetary space and forecast their impacts.

PAPERS SCHEDULED FOR POSTERS

VARIABILITY OF THE VERTICAL EXTENT OF IONOSPHERIC E-LAYER OVER A STATION WITHIN EQUATORIAL ANOMALY

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Abstract: This study defined the vertical extent of E-layer of the ionosphere as the vertical altitude of E-region of the ionosphere and investigated its variability, within the equatorial ionospheric anomaly region, using day time direct measurements of the virtual height of E layer measured with an ionosonde at Ouagadougou (geog. lat. 12.4 N, long. 1.5 W and magnetic dip 5.9 N) for years 1985 (high solar activity) and 1990 (low solar activity). The hourly scaled data were analyzed for the two years. The E-layer was observed to be thicker (36-40) km at sunrise and sunset while thinnest (18-22) km at noon for both years. Seasonal variation shows that vertical extent of E-layer during the solar minimum (maximum) is higher in September (March) equinox and lower at March (September) equinox. The Vertical extent of E-layer was found to be an unstable membrane as it varied from hour to hour, day to day, month to month and season to season in response to the in response to solar activity. The VE is in thicker in the low solar activity (26.30 ± 3.47 km) than the high solar activity (23.01 ± 2.62 km). Between 5.4% and 35.9% of the total variation of VE is solely accountable for by variability in solar activity while the remaining percentage may be due to other factors. This implies that increase (decrease) in the solar activity result to decrease (increase) in vertical extent of E-layer.

PRELIMINARY INVESTIGATION OF EFFECTIVE EARTH RADIUS FACTOR (K-FACTOR) OVER AKURE, NIGERIA

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Abstract: In radiowave propagation, k-factor plays a key role such as, radio coverage planning, microwave links engineering, interference estimates, and so on. Hence, the knowledge of the statistical distribution of the k-factor is very important from the radio spectrum perspective. This study present the result of in-situ measurements of atmospheric pressure, temperature and relative humidity made in Akure (7.15^{o}N, 5.12^{o}E), South Western Nigeria, using Wireless weather stations (Integrated Sensor Suite, ISS). The study utilized the result of the initial two years of meteorological data measured from January 2007- December 2008 to calculate refractivity, its gradient and subsequently the effective earth radius factor (k-factor). The result show that the average values of k-factor is 1.51 for the two year period of this report. This implies that the propagation condition in this geographic zone could be said to be super-refractive.

Keywords: Troposphere, radio refractivity, refractivity gradient, k-factor.

AN EMPIRICAL ASSESSMENT ON THE PERFORMANCE OF THE INTERNATIONAL REFERENCE IONOSPHERIC MODEL OVER NSUKKA, NIGERIA USING GPS DATA

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Abstract: The International Reference Ionosphere (IRI) model has been widely adopted as the international standard for specifying ionospheric parameters. An evaluation on the performance of the IRI model over Nsukka (6.87N, 7.38E), Nigeria is presented in this work. We compare Total Electron Content (TEC) values from the IRI model with TEC data from the SCINDA (Scintillation Network Decision Aid) GPS receiver installed at Nsukka so as to evaluate the performance of the model over the region. Given the proliferation of dual-frequency GPS receivers over the African continent, data from these equipments is proposed for use in TEC modeling over the continent together with the IRI model. Knowledge on the performance of the IRI over various regions of the continent will inform the extent to which the model will be used.

REGIONAL IONOSPHERIC EFFECT ON GPS RANGE MEASUREMENTS

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Abstract: In this research paper we examine the range measurement error on single frequency GPS caused by the earth's ionosphere. Since the deactivation of the inbuilt system inherent error (Selective Availability), the earth's ionosphere has been the largest source of error to GPS range measurements. Total Electron Content (TEC), a constituent of the earth's ionosphere slows down the velocity of GPS signals. This delay observed produces the range measurement error, which ultimately affects position accuracy. The delay is proportional to TEC and inversely proportional to the square of the signal frequency of the GPS satellite on transionospheric propagation, which explains that the ionosphere is a dispersive medium to GPS signals. In this research paper, GPS range measurement error has been investigated for high, mid, and low latitude region. The observations in general, indicates that at low latitude region high range measurement errors were recorded relative to the other regions, with the high latitude region exhibiting an irregular pattern variation and the mid and low latitude exhibit a day time broad plateau with GPS range measurement error peak at mid day. Furthermore, the study also agrees with the theory of ionospheric disturbance at high and low latitude region ionosphere, whereas at mid latitude region seems to be moderate and the level of range measurement error is comparatively minimal.

Keyword: GPS, Ionospheric Delay, Range measurement, TEC.

STUDY OF THE IONOSPHERIC SCINTILLATIONS AND TEC CHARACTERISTICS AT SOLAR MINIMUM IN A WEST AFRICAN EQUATORIAL REGION USING GPS DATA

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Abstract: This paper presents a study on the characteristics of ionospheric scintillation and the Total Electron Content (TEC) at solar minimum in an equatorial region. Ionospheric scintillation is a rapid variation in the amplitude and phase of trans-ionospheric radio signal resulting from density irregularities in the ionosphere. It is referred to us by the index S4. The data used are the scintillation index (S4) and the vertical TEC (vTEC) recorded at the SCINDA GPS station of Abidjan (Latitude = 5.34^o N, Longitude = 3.90^o W). This work covers the period from January 2008 to January 2009, two years of low solar activity with R12 equal to 2.8 and 4.2 respectively. The multipath effects on the scintillation index were removed following the method adopted by Otsuka et al., (2000). The results show that the scintillation is not intense with S4 values lower than 1 in most of the cases and during the course of the day. However from 2000 to 0200 there are relatively high values of S4 confirming that scintillation is primarily a nighttime observed phenomenon. The scintillation shows a seasonal effect characterized by intense value in the equinoctial months compare to that of the solstice season. The vTEC in general exhibits a diurnal variation as a function of the solar zenith angle. Higher vTEC values are observed around 1100 and 1500 local time and have the same seasonal variation with the S4 index.

ANALYSIS OF DATA ON TROPOSPHERIC WATER VAPOUR USING NOAA SATELLITE DATA

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Abstract: The EUMETSAT Satellite Application Facility on Climate Monitoring (CM-SAF) focuses on retrieving geophysical parameters related to the Earth's water and Energy cycle from satellite data employing inversion schemes based on radiation transfer theory. Here, the daily mean vertically integrated water vapour (TPW) and the monthly mean layered vertically integrated water vapour (i.e. Low-level precipitable water vapour, LPW, (kg/m^2), Mid-level precipitable water vapour, MPW, and the Upper-level precipitable water vapour, UPW, generated employing measurements from polar orbiting (NOAA) platforms for the period 2004-2008 and for 19 stations in Nigeria have been studied. Double peaks are manifested by these water vapour parameters at the coastal and guinea savannah regions, while at the midland and sahelian regions, single peak lasting between May and September results. The double peaks manifested by TPW, LPW and MPW at the coastal and guinea savannah regions, and the single maximum exhibited by them at the midland and the sahelian regions are in synchronism with the movement of the rain producing zone called inter tropical discontinuity (ITD).

Comparisons have been made between the retrieved precipitable water from CM-SAF (CM-SAF PWV) with data from radiosonde (RS) obtained from the archives of the Nigerian meteorological society. Time series comparisons of the products from these instruments show that CM-SAF PWV at all levels observed are greater than RS-PWV. For instance, CM-SAF PWV is greater than RS-PWV in Lagos with a scale factor of 0.1572 ± 0.07. Also time series inter-comparison between them shows that CM-SAF PWV and RS-PWV agree with correlation coefficients ranging from 0.55 to 0.93 at all the levels and at all the stations investigated.

Checking of seasonal effect on data acquisition by the different instruments shows that in most cases, the data from the two instruments are not related at the different seasons and at the different zones.

Keyword: Geophysical, Satellite, inversion scheme, radiation transfer theory, precipitable water, and scale factor.

IMPACTS OF METEOROLOGICAL FACTORS ON SURFACE REFRACTIVITY IN JOS

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Abstract: Daily and monthly variation of meteorological parameters of temperature, pressure and relative humidity as well as the surface refractivity in Jos (8.9^{o}E, 9.9^{o}N, alt. 1238m) a high altitude station has been studied from March 2008 to September 2009. In addition, seasonal variations of the surface refractivity index were also carried out. Results show that the daily and monthly surface refractivity index was variable as well as seasonal values. It was discovered that refractivity in Jos during wet and dry seasons were generally high although that of rainy season is higher. This is attributed to high cloudy nature of Jos throughout the months.

THE INTERNATIONAL REFERENCE IONOSPHERE (IRI)

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Abstract: At equatorial latitudes, the ionosphere offers an aspect different from that observed at mid and high latitudes. Indeed, the F2 layer dynamics is mainly governs by the electromagnetic drift induced by the combined presence of the electric field (E) of the dynamo region and the earth's magnetic field (B) almost horizontal and directed towards the North (Bramley and Peart, 1965). The International Reference Ionosphere (IRI) model which is considered as the best ionospheric model (Szuszczewicz et al., 1993) does not represents a major behaviour of the hmF2 in particular its strong rise during the post-sunset time. In the framework of the improvement of the IRI model, Obrou et al., (2003) have investigated on the relationship between the hmF2 and the vertical drift derived from Scherliess and Fejer (1999). Contrary to this former work, the present paper established a relationship between the observed drift and the model ones. The observed drift was inferred based on the method used by Oyekola (2006). The results show a good agreement both at low and high solar activity. The data used are those of the station of Korhogo in Côte d'Ivoire (Latitude +9.3; Longitude - 5.4, Dip -0.67).

IMPACTS OF IONOSPHERIC SCINTILLATIONS ON GPS RECEIVERS DEDICATED FOR AVIATION APPLICATIONS

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THE EMPIRICAL CORONAL MASS EJECTION ARRIVAL MODELS (ECA)

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Abstract: The empirical coronal mass ejection arrival models (ECA) were used in the estimation of 29 CMEs events using the onset of associated intense geomagnetic storms. It was found out that for G2000 model, the average error between the predicted transit time and the actual transit time $<\Delta\tau 1>$ is 14.71hrs and the fractional error ($<\Delta\tau 1/\tau>$) is 0.57. For G2001 model, the average error between the predicted and the actual transit time $<\Delta\tau 2>$ is 11.59hrs and the fractional error ($<\Delta\tau 2/\tau>$) is 0.36. And the average error between the predicted and the actual transit time of the CMEs, $<\Delta\tau 3>$ is 10.21hrs and the fractional error ($<\Delta\tau 3/\tau>$) is 0.28 for VG2002. We also investigated season as a possible source of error in estimated time of arrivals of CMEs, a high fraction of CMEs that occurred during Solstice arrived later than the predicted and during equinox, the fraction of the CMEs that arrived earlier than predicted is averagely the same with the ones that arrived later than predicted. Moreover, in the study of the contributions of the Coronal mass ejection to intense geomagnetic storm events, thirty-eight events (38) of forty-four (44) CMEs occurrence(s) were co-related with the intense geomagnetic storms.

A COMPARISON OF TEC FLUCTUATIONS AND IONOSPHERIC SCINTILLATIONS AT AKURE, NIGERIA

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Abstract: This research investigated the transient variation of rate of change of TEC and examined ionospheric scintillation levels using SCINDA data obtained in the year 2010 at Akure, Nigeria. Scintillation Network Decision Aid (SCINDA) is a real-time, data driven, communication outage forecast and alert system. Fluctuations in TEC were more in daytime than night time. This is attributed to the daytime influence of solar activity on the ionization within the ionosphere. Seasonal dependence of ROTI was investigated. The ionospheric scintillation levels were critically examined in order to establish the probable relationship between scintillation occurrence and the rate of change of TEC.

RESEARCH ON GRAPHENE

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Abstract: Research on graphene has shown that its properties are more apparent for use as a satellite material. It is incredibly strong and has great conductive abilities. Graphene is essentially an atomic form of graphite which has high conducting properties and has the potential to greatly decrease the cost of creating devices for production of dishes. This presentation will explore the use of graphene as a material for satellite dish to enhance durability, portability, affordability, and effective signal transmission.

A REVIEW OF ANTENNA INTERFERENCE SUSCEPTIBILITY AND MITIGATION IN SATELLITE COMMUNICATION AND NAVIGATION

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Abstract: The presentation provides a review of antenna interference scenarios, link analysis, interference mitigation techniques, adaptive interference cancellation and their applications in space segment technology.

OVERVIEW OF THE WORK DONE IN THE FRAMEWORK OF THE UNBSSI (1991-2011)

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and
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Abstract: In this talk we review the work done by the whole word network of scientists involved in different projects of the UNBSSI (United Nations Basic Space Science Initiative) : IEEY (International Equatorial Electrojet Year), IHY (International Heliophysical Year) and ISWI (International Space Weather Initiative). In a first part this paper will present the organization of the work in the different fields of research and the key role the organization of the work between developing and developed countries based on sharing practices. The main second part will provide a quick look on all the new results obtained concerning the following topics :
*Long term variations in the equatorial ionosphere at the magnetic equator and on the tropical ionization crests in Asia,
* Relations between the solar component of the magnetic field and equatorial inosphere
* Long term variations in magnetic activity,
* Total Electron Content during maximum and minimum Sunspot Cycle,
* Solar action on geomagnetism,
*Equatorial electrojet,
*Equinox transition at the magnetic equator,
*Regular variation of Sq magnetic field in Vietnam,
* Ionosphere Disturbance Dynamo,* Terrestrial movements of the earth's crust deduced from continuous measurements of GPS Stations in South-East Asia,
* Use of GPS data to estimate the water vapor content of the Troposphere,
*Climatology of gravity waves activity
*Vietnamese monsoon
Etc…

IRGGEAA : International Research Group In Geophysics Europe Africa Asia

STATISTICAL COMPARISON OF SURFACE REFRACTIVITY VARIATION OVER NIGERIA

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Abstract: Meteorological data collected from fourteen weather stations spread across all climatic regions of Nigeria over a period of two years was employed for this research to determine statistical distribution of surface refractivity over Nigeria. The correlation analysis shows that while the variation follows the same pattern of high refractivity value in the rainy season and low value in the dry season, the refractivity value is always increasing from the end region in the north-most part of the country to the coastal region in the south-most part of the country.

DAY-TO-DAY VARIABILITY OF TOTAL ELECTRON CONTENT OBTAINED FROM GPS OVER AKURE, NIGERIA

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Abstract: The day to day variability of the total electron content (TEC) was examined by using a fixed GPS receiver installed at Akure (7.3°N, 5.3°E), Nigeria. This work investigates the diurnal and the seasonal variability of TEC over Akure, Nigeria, based on one year data (Jan 2010-Dec 2010) and also being a station within the equatorial anomaly region. The day to day variability was calculated by mapping the observed slant TEC value for every 1hr to the vertical using a single geometrical factor and the differencing (ΔTEC) with its corresponding value from the previous day. The result shows the mean monthly TEC values varies from the minimum at 0200hrs LT (UT +1hr) to a peak at about 1400hrs LT and then decreases. There is a clear daily variation which depicts the expected temporal variability. Seasonal variation of the day to day variability was also examined.

IDENTIFICATION OF NIGHT-TIME OF F REGION CURRENTS FROM CHAMP SATELLITE OBSERVATIONS OVER EQUATIORIAL AFRICA

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Abstract: The ionospheric F-region currents inferred from the interpretation of the magnetic signatures are investigated using CHAMP satellite data. The observations are limited to the quiet days, with the Dst index less than 20 and on the night side of 2000hrs to 0500hrs for a period Jan,2001 to Dec,2001. In this paper, we report the F-region currents as inferred from the CHAMP vector data for the African sector of the equatorial ionosphere. We find the spatial confinement of the currents to the near the equatorial region bounded by the Appleton anomaly and their appearance in the pre-midnight and post-midnight sectors.

SATELLITE DISHES ARE BECOMING UBIQUITOUS IN RECENT TIMES

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Abstract: Thus more communication satellites will certainly be launched, and the growth explosion in individual satellite dish ownership will increase. There is the need therefore for smaller and less costly devices for the production of the dishes. Research on graphene has shown that its properties are more apparent. It is incredibly strong and has great conductive abilities. Graphene is essentially an atomic form of graphite which has high conducting properties and has the potential to greatly decrease the cost of creating devices for production of dishes. This research will explore the use of graphene as a material for satellite dish to enhance durability, portability, affordability, and effective signal transmission.

NIGERIA ENVIRONMENTAL CLIMATIC OBSERVING PROGRAM (NECOP)

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Abstract: **NECOP** is a project designed to establish a network of meteorological & climatological observing stations, spatially located across Nigeria. The aim of NECOP is to create a network of stations that is now carrying out, for the first time, simultaneous basic measurements of meteorological & climatological variables, in real time, through telemetry technology, with 5mins update cycles. It is indeed an invaluable tool for researchers, environmentalists, academics, policy makers and students at al levels to forge ahead in their respective tasks. OBJECTIVES OF NECOP a) To create a network of stations that will carry out, for the first time, simultaneous basic measurements of meteorological & climatological variables, in real time, through telephone telemetry technology, with 5mins update cycles. b) To have a fully computerized real-time data analysis system that will support decision and policy making under a wide range of scenarios of meteorological and climatological threats. c) To develop a real-time data acquisition and delivery system as an important tool for public education and awareness purposes during emergency management events. d) To provide high-quality data for scientific research addressing meteorological and climatic variability with relevant spatial and temporal scale. NECOP is being executed in collaboration with Centre for Climatic Research, Delaware, United States, NIMET and Nigerian Universities.

JOULE HEATING IN THE LOWER THERMOSPHERE CAUSED BY LARGE-SCALE FIELD-ALIGNED CURRENTS – SOLAR WIND AND INTERPLANETARY MAGNETIC FIELD INFLUENCES

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Abstract: Magnetosphere-ionosphere-thermosphere (M-I-T) coupling represents a nonlinear dynamical system having very complex properties. Recent studies on processes of (M-I-T) coupling have revealed that the global electromagnetic energy input exceeds the particle energy input by about 4 times (e.g. Lu et al., 1995). The electromagnetic energy flux between the magnetosphere and ionosphere consists mainly of field-aligned currents (FAC) and wave processes. In its turn, the neutral atmosphere (the thermosphere) can have significant influence on the ionospheric electrodynamics. The thermospheric and ionospheric effects of the field-aligned-current variations at high latitudes have been modeled by the use of a new version of the large-scale field-aligned currents (FAC) developed recently (Nenovski, 2006, 2008). This FAC model yields quantitatively the FAC structures and FAC intensity distribution at higher latitudes (>60 degrees) depending on the solar wind and interplanetary magnetic field (IMF) variations. The responses of the electron concentration, ion, electron and neutral temperatures, thermospheric wind velocity and electric-field potential to the variations of the field-aligned current density in the polar ionosphere, polar cusp and cap have been calculated by solving the corresponding continuity, momentum and heat balance equations. While the electron concentration and electron temperature disturbances are caused mainly by ionization and heating processes due to the particle precipitation, the ion temperature disturbances are influenced strongly by Joule heating of the ions due to the electric field/field-aligned current disturbances in the polar ionosphere. As expected the ionospheric disturbances have appreciable magnitudes at the geomagnetic latitudes 68°-85° depending on the solar wind velocity and the IMF orientation. The thermospheric disturbances are generated mainly by the Joule heating (ion drag) and propagate to lower latitudes as traveling ionospheric disturbances (TID) and/or large-scale atmospheric gravity waves. The latter have appreciable influences at significant distances from the region of the FAC structures.

SID MONITORING IN SLOVAKIA

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Abstract: This contribution presents the Slovak SID monitoring network. One SuperSID monitor kindly provided by the Stanford University in the frame of the ISWI SID monitor network is installed in the Slovak Central Observatory in Hurbanovo and other is being installed in the Astronomical Observatory in Rimavska Sobota. Morover, there are several SID monitors constructed by R. Slosiar (Bojnice) and J. Karlovsky (Hlohovec) operated in Bojnice (http://195.160.182.241/page/rudy/), Hlohovec (http://karlovsky.info/sid/temphtml.htm), Hurbanovo (http://www.suh.sk/skypipedata.htm), and Partizanske (http://195.160.182.241/page/). Results on registration of solar flares are presented as well.

CORONAL MASS EJECTIONS (CME) AND PARTICLE ACCELERATION

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DETERMINATION OF METEORITE IMPACT CRATER'S SIZE USING SIMULATED MODEL EXPERIMENT

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Abstract: A lot of evidence abounds on the fall of meteorite in various parts of Nigeria from time immemorial. Some of these meteorite collected by scientists from the Centre for Basic Space Sciences, Nsukka, Nigeria were analyzed using atomic absorption spectrometer, petrographic microscope, bar magnet, and other facilities at the University of Nigeria Nsukka, and Center for Energy Research and Training (CERT), Ahmadu Bello University Zaria. In addition, some of these samples were also sent to Harvard Smithsonian Centre for Astrophysics, Cambridge, USA and the preliminary analysis indicated that these samples were ordinary earth crossing meteorite. In most of these historical meteorite falls in Nigeria, we have been unable to take accurate on-the-spot measurement of the impact craters created at the time of fall due to natural and man-made factors. This work seeks to determine a relationship between the size of a meteorite and that of the impact crater produced through simulation of meteorite falls in the laboratory. The result of this work will help us to determine the original/actual size of the impact crater produced by any meteorite once the mass of the meteorite is known and vice versa.

APPLICATION OF ENVISAT SAR IMAGERY FOR MAPPING AND ESTIMATION OF NATURAL OIL SEEPS

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Abstract: This project is an exploratory research to investigate how best Ghana can employ SAR onboard the Envisat satellite at Cape Three Point (CTP) and other oil fields in the country. Our approach will perform radar image segmentation using the original noisy pixels as input data, i.e. without any preprocessing step. The algorithm will include a statistical region growing procedure combined with hierarchical region merging. On the basis of computer processing and analysis of SAR images together with bathymetry, geophysical and seismic data, and information in GIS, a link between these slicks and active seepage phenomenon in the CTP will be established. Spatial analysis of multi-temporal SAR satellite imagery over the CTP is expected to provide information on seep locations, frequency and seep rates.

APPLICATION OF GIS IN ANALYSES OF URBAN HEAT ISLAND IN CALABAR METROPOLIS

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Abstract: Heat island forms as cities replace vegetation with pavement for roads, buildings and infrastructures that absorbs and re-radiates the heat, thus increases surface and ambient air temperatures of Calabar Metropolis. It also impact negatively on human health and the environment. Higher temperature causes an increase use of air conditioners which results in additional power plant emissions of heat trapping greenhouse gasses. The study investigated urban heat island by measuring meteorological elements like air temperature, heat index, relative humidity, wind speed/direction, and cloud cover using weather tracker device and Global Positioning Systems (GPS) while physical observations were made to determine vegetation cover and built-up area. Sampling data were collected in synoptic hours in six (6) locations in the metropolis and two points in the rural area. The data were subjected to statistical and GIS to determine the heat index in the study area. The results showed that Mobil, Orok Orok, SPC Junctions and Watt Market were points with highest temperature. Statistically, the study also revealed that there is a significant variation in heat index between urban and rural areas.

THE USE OF USING GEOELECTRIC FIELDS AND AURORAL ELECTROJET INDICES IN FORECAST OF GEOMAGNETICALLY INDUCED CURRENT

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Abstract: The effects of space weather on ground based technology mostly occur due to the varying geomagnetic field during geomagnetic storms produces geo-magnetically induced current (GIC). Space weather storms involve intense and rapidly varying electric currents in the ionosphere, which create geo-electric and geomagnetic fields at the Earth's surface. In this study we investigate some intense geomagnetic storms: 18 September 2000; 31 March 2001; 21 October 2001; 6 and 24 November 2001; 29 amd 31 October 2003 and 9 November 2004. The electric field for each day is computed using ground conductivity and geomagnetic recordings. The conductivity models are determined by least square fit between the observed and predicted GIC values. Our results show that GIC are strongly correlated with the geo-electric field, and also with eastward (AU) and westward (AL) auroral electrojet indices and time derivatives of the horizontal geomagnetic field. RMSE (Root Mean Square Error) statistical test was employed to evaluate the accuracy of the models used.

SPATIAL DISTRIBUTION OF TOTAL ELECTRON CONTENT OVER NIGERIA

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AUTOMATIC DETECTION OF GEOMAGNETIC SUDDEN COMMENCEMENT VIA MODWT.
SHORT DESCRIPTION:

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Abstract: It is of great importance to develop an algorithm that auto-detects sudden commencement (SC) because it could be an indicator of the onset of the geomagnetic storm. Automatic detection of sudden commencement is based on multi resolution analysis of maximal overlap discrete wavelet transform using Haar wavelet filter. Maximum standard deviation of algorithm detection times is observed to be one minute of the corresponding arrival times published by National Geophysical Data Center (NGDC).

NEW WEATHER STATIONS FOR MONITORING GLOBAL WARMING AND ENERGY ISSUES IN CAMEROON

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Abstract: This study presents the efforts done by the government to provide us with weather stations which can be used to monitor many atmospheric parameters.
In the first part, we present the national objectives for installing theses weather stations. After that, sensors used for measurements are presented, as well as the physical parameters it can measure. The SCINDA sensors recently installed at the University of Yaounde 1 are also presented. Some results are discussed and compared with old data to appreciate the evolution of climate change. The results are also discussed to find possible correlations with space phenomena.

RAPEAS AND AIRES SHED NEW LIGHT ON SPACE WHEATER STUDIES OVER ARGENTINA

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Abstract: We introduce the recently created "Argentina Network for Upper Atmospheric Research", whose Spanish acronym is RAPEAS, to the international scientific community. The Network's mission is to consolidate in Argentina the scientific and technological community dedicated to studying the Earth's upper atmosphere and its space environment. The general aim is to encourage and strengthen research and technological development, contribute to the sustainability of human resources and improve the use of instrumental facilities already installed or to be installed in the future. The major specific objective of RAPEAS is to maximize the benefits of the new project AIRES ("Argentina Ionospheric Radar Experiment Station").
AIRES foresees the installation and subsequent use of an incoherent scatter radar of advanced technology in Argentina through a joint effort between the United States National Science Foundation (NSF) and the National Council of Scientific and Technical Research of Argentina (CONICET).
Both RAPEAS and AIRES are presented in detail (mission, general objective, members) along with their specific objectives, instrumentation, activities and future plans. Enhancement of the international cooperation and joint projects promotion are envisaged.

SOLAR ACTIVITIES AND SPACE WEATHER RELATIONS

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Abstract: Geomagnetic storms have a good correlation with solar activity and solar radiation variability. Many proton events and geomagnetic storms have occurred during solar cycles21, 22, and 23. The solar activities during the last three cycles, gave us a good indication of the climatic change and its behavior during the 21st century. High energetic eruptive flares were recorded during the decline phase of the last three solar cycles. The appearances of the second peak on the decline phase of solar cycles have been detected. Halloween storms during Nov. 2003 and its effects on the geomagnetic storms have been studied analytically. The data of amplitude and phase of most common indicators of geomagnetic activities during solar cycle 23 have been analyzed.

A HISTROIC METEORITE IMPACTS

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Abstract: It deals with major meteorite impact events in historical geology regarding to the geological time scale.

PREDICTION OF SOLAR RADIATION USING ARTIFICIAL NEURAL NETWORK WITH METEOROLOGICAL DATA FOR UYO AND WARRI

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Abstract: This paper is intended to address the following topic in the programme topic: ï¿½ SOLAR PHYSICS ï¿½ ATMOSPHERIC PHYSICS ï¿½ SPACE WEATHER MODELING : This paper presents an artificial neural network (ANN) approach for estimating hourly global solar radiation (HGSR) for Uyo and Warri. The ANN models are presented and implemented on real meteorological data. The meteorological data of some atmospheric parameters from two stations are used for training the ANN and raw data from same stations of solar radiation are used for testing the predicted values. The data collected spans the time period of seventeen years (1990 ï¿½ 2007) for Uyo (latitude 5^o 1êžŒ, N and longitude 7^o 53êžŒ E) and Warri (latitude 5^o 30êžŒ N, Longitude 5o 41êžŒ E.). The MLP (multi-layer perceptron) three-layer back-propagation network learning is used for the modeling. Forecasting performance parameters such as root mean square error (RMSE), mean bias error (MBE) and absolute fraction of variance (r^2) are presented for the model. A comparison of estimated global solar radiation with well-known data is carried out. The estimated global solar radiation data are in reasonable agreement with the actual values. The results indicate the generalization capability of the ANN technique over unseen data and its ability to produce accurate predictions. The result show that ANN model predicts better than other models.

INFRARED ACTIVATED BLOWERS FOR ANTENNA FEED SYSTEMS

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Abstract: The amount of water, snow or condensation in ground antenna systems can cause additional signal degradation from the expected propagation attenuation due to rain. In certain climatic zones it is necessary to take measures to remove moisture and water droplets from the surfaces of antenna and feeds. In this study, utilizing reflection type infrared (IR) sensor and some electronic devices, the authors have developed an IR activated rain sensor system to control a fan blower motor and heater using pulse width modulation. This arrangement has successfully removed rain drops and condensation from a 3m RFHam design small radio telescope antenna feed system during a mild rain shower, without affecting observation.

DEPENDENCE OF GEOMAGNETIC STORM ON INTERPLANETARY MAGNETIC FIELD –BZ ACROSS LATITUDES

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Abstract: A comprehensive study of geomagnetic storm variations and its dependence on interplanetary magnetic field-Bz (IMF-Bz) at dip, low and mid latitudes has been extensively carried out. Data set of H geomagnetic component for the years under study was employed for only quiet conditions. The observed Sq field variation was attributed to the seasonal variation of ionospheric electron content (IEC). It was observed that the geomagnetic storms (GMSs) with H-component amplitude (ΔH) values larger than 45nT occurred more in the nighttime than the daytime. While values of GMSs with values between 80 and 150nT at the low latitudes were still larger during nighttime than daytime side, except for those near the equator latitude. This trend of amplitude variation was found to be associated with position of IMF-Bz. GMSs amplitudes were larger in nighttime, when IMF-Bz turned northward and larger still when it turned southward. We therefore inferred that GMS variation is dependent on IMF-Bz.

Key words: Interplanetary magnetic field, geomagnetic storm, latitudes, amplitude, H-component.

EFFECTS ON MIDDLE AND LOWER ATMOSPHERE

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Abstract: One of the most interesting, but still controversial, areas in space and geophysical sciences is the possible connection of space weather with terrestrial weather and climate. Evidently there is a coupling between these phenomena but the link is not simple. It is also not understood yet how large the space weather contribution might be compared to other factors, such as direct solar radiation, determining atmospheric weather. One of the clearest evidence of a coupling is obtained from observations on lightning discharges that propagate from the tops of thunderclouds upwards to the ionosphere (Sentman, 1998) which is strongly affected by space weather. Lightning heat the atmosphere and produces ionisation and thus cause changes in the global electric circuit and terrestrial weather.

FIRST RESULTS OF DETECTION AND ANALYSIS SID MONITOR AND THE GPS INSTALLATION AT KISANGANI AND KINSHASA

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The first results of detection and analysis SID monitor and the GPS installation at Kisangani and Kinshasa. In this study we are improving the SID signal. The monitors detected by changes to the earth's ionosphere caused by solar flares and others disturbance. The signal is corrupted and need to be fitted in using the resonant RLC method and Daubes show wavelet method.

STUDY OF MAGNETIC PULSATION BY USING MAGDAS FOR SPACE WEATHER PROGRAM IN INDONESIA

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Abstract: Understanding of interaction between solar wind and magnetosphere important to support space weather program. Manifestation of the interaction can be observed as occurrence of magnetic pulsation from ground. In this paper/presentation will be shown our results of on the study of magnetic pulsations by using MAGDAS data in Indonesia.

ANALYSIS OF POSITIVE GEOMAGNETIC STORMS

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EVOLUTION OF CORONAL MASS EJECTION IN THE SUN-EARTH DISTANCE - SPACE WEATHER CONSEQUENCES

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I would like to give a 30-minute invited presentation on this topic and I would also be glad to give, if required, a course on "Flare/CME Initiation" at the workshop.

MAGDAS DEPLOYMENT - CURRENT STATE : THE CURRENT STATE OF MAGDAS IN AFRICA AND THE REST OF THE WORLD

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Abstract: We report on the current state of the MAGDAS Project, which has expanded every year since 2005. Since the ISWI workshop in Cairo in 2010, three new MAGDAS stations have come on line: (1) Canberra, Australia, (2) Ica, Peru, and (3) Khovd, Mongolia. This brings the new global total to 57 MAGDAS stations. We also briefly report on the new work horse of the MAGDAS Project: MAGDAS 9, manufactured by Tierra Technica of Japan.

INTERACTION OF INTERPLANETARY CORONAL MASS EJECTIONS/MAGNETIC CLOUDS AND ITS INFLUENCE ON THE GALACTIC COSMIC RAY INTENSITY

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Abstract. We analyze the response of the galactic cosmic ray (CGR) intensity to the passage of the two interplanetary coronal mass ejections (ICMEs) occurred 14 and 15 February 2011 whose have origin from same active region AR 11158. For the kinematic analyze we utilizing images obtained from the Extreme Ultraviolet Imager (EUVI), as well as COR1, COR2 and HI-1 coronagraphs on board the twin STEREO spacecraft. Data from the WIND satellites (magnetic field, speed of the solar wind, proton density and the thermal speed) and the galactic cosmic ray data from SEVAN Aragat detector were used to tell us when eruption is arriving to distances 1 AU. With the two STEREO spacecraft we were able to follow the eruptions up to the distances of almost 80 solar radii. During the eruptions STEREO A and STEREO B have separation angles with Earth 94° and 86°, respectively. Eruptions are highly correlated with the SXR flares energy release. The solar coordinates of flares are (S20,W14) and (S21,W18) respectively. Regarding to position of the STEREO spacecraft's and location of the associated flares, the projection effect on ICMEs kinematics is minimal. ICMEs occurred 14 Feb 2011 is eruption not connected with prominence, maximum velocity was $v_{max} \approx$ 400 kms^{-1}. However, ICME occurred 15 Feb 2011 is much violent eruption connected with prominence, with maximum velocity of $v_{max} \approx$ 1400 kms^{-1} and brought ICME 14 Feb at distance 32 solar radii. So these two events represent example of the CMEs connection (or popular CME cannibalism). Emphasize, that during the passage of these ICMEs connected structures, a classical two step “Forbush decrease” occurred. Forbust stars at 16 Feb 2011 around 4:00 h, and have second peak 17 Feb 2011 around 22:00 h. Estimated arrival time of the ICME at the 1 AU are t_A= 02:10 UT ± 1 h; 18 February 2011 (obtain from STEREO A data) and t_B= 05:10 UT ± 1 h; 18 February 2011 (obtain from STEREO B data). We find that, estimated times are in coincidence with the time of observed second step maximum of the Forbush decrease which is due to the CME body (t_{Forbus}= 00:30 UT ± 3 h; 18 February 2011).

STUDY OF THE MAGNETOSPHERIC AURORAL ACTIVITY OF PLANETARY BODIES

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Kiruna, Norbotten, Sweden

Abstract: The interaction between the solar wind and the planetary bodies is a fascinating area of studies in space physics. Aurora is one such phenomenon observed in Polar Regions of planetary bodies having a magnetic field around them. In the current study we present the typical classification of aurora borealis observed at the north pole of the planet earth. The IRF (Swedish Institute of Space Physics) has provided the Magnetometer, Riometer readings archive to get the data for the analysis along with the photographs using the all sky camera, using which the phenomenon has been observed.

SPACE RADIATION: MODELLING AND ITS EFFECTS ON SPACECRAFTS

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Abstract: This talk will focus on the different space radiation models available, and how they can be used to comparatively assess the amount of radiation a spacecraft will be exposed to at different regions in space. More so, the effects of radiation on spacecraft electronics will be presented, using an indigenous African spacecraft as a test case.

A RADIO TELESCOPE FOR JOVIAN DECAMETRIC AND SOLAR EMISSIONS AT 20.1MHZ

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Abstract: It is well known that the planet Jupiter produces strong radio bursts in VHF band (decametric wavelengths)from regions of temporary radio emissions in it's magnetosphere. The Sun emits similar radiation from surface and coronal activity. These signals can be detected on Earth and recorded for further analysis with a simple, inexpensive but effective radio telescope based on the design from NASA's Radio JOVE project. The paper discusses the assembling, installation and preliminary observation with this telescope at CBSS permanent site, Nsukka.

Keywords: Antenna ,Radio Telescope, Radio Emission, Radio Bursts.

THE VARIABILITY OF GEOMAGNETIC FIELD ELEMENTS (H & Z) AT THE AFRICAN LONGITUDES

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Abstract: Data generated from four different African observatories has been used to study the variability of geomagnetic field Horizontal (H) and Vertical (Z) field elements. The analysis was carried out on solar quiet days using the hourly values of the geomagnetic field elements. The variation was calculated after the non cyclic and effects of sources other than Sq were removed.

SUB-STRUCTURE OF THE NIGER DELTA REGION USING THE SOLAR QUIET (SQ)

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Abstract: Attempt has been made to determine the upper mantle sub-structure of the Niger Delta region using the Solar quiet (Sq) day current in this region. The study involved the use of the quiet day geomagnetic data obtained from Gauss spherical harmonic analysis (SHA) technique and employed in other to separate the internal and external field contributions to Sq current system. Results reveal that the depth to subsurface structures could be determined using Sq current systems. It is suggested that data of geomagnetic components recorded in Nigerian stations, particularly using our own installed magnetometer be further employed in future work. This innovative technique of utilizing ionospheric events/geomagnetic variation should be extended to other parts of Nigeria.

USE OF GPS TECHNOLOGY FOR TRANSPORT MANAGMENT : CASE OF SOTRA (Abidjan City Bus Company)

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TRAIN TRACKING AND SPACE TECHNOLOGY ADAPTATION IN NIGERIA

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Abstract: The success of modern railways, whereby passenger trains such maglev and/or bullet are on the range of 250/km per hour, is attributable to the sophistication of the space technology which allows for real- time monitoring of trains movement, and consequently minimize considerably the possibility of avoidable crashes in developed countries railways. Typical examples in this regard is the Shinkassen of Japan. The success of the Shinkassen is however motivating most developing countries such as South Korea and China to adopt the high speed train technology in combination with the utilization of space technology in train traffic control and management.

Developing country such as Nigeria is equally looking toward launching high speed train, in not too long distant time, considering the 25 year railway development plan embarked upon by the country. This paper at examining the possibility of harnessing the Nigeria NIGCOMSAT, by integrating the usage of satellite technology in train traffic tracking, control, management prior the implementation and construction of network of high speed train in Nigeria.

REGIONAL TREND ANALYSIS OF PAN EVAPORATION IN NIGERIA (1970 TO 2000)

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Abstract: The trends pan evaporation (PE) in 4 different climatic regions (Sahel, Midland, Guinea Savannah and Coastal/Tropical Rainforest) covering about 21 tropical stations in Nigeria (during the period 1970 to 2000) were investigated. The influence of meteorological variables, which have significant impact on the spatial and temporal trends of pan evaporation for three consecutive decades across the different regions in Nigeria was tested. Mann-kendal statistical test was carried out to investigate the trend. A decade to decade trend analysis was carried out for 3 consecutive decades over all the regions. A general decrease trend was observed in all the regions except Sahel region in the first decade under consideration. The decade (1970 to1979) coincided with the period when there was a global solar dimming. However, the rest decades witness an increase trend in pan evaporation for all the climatic regions across Nigeria. The general trend analysis of PE for Nigeria shows that about 80% of stations involved in the study experience increasing trend (development of arid condition) out of which, only 50% were significant. The rest 20% exhibited decreasing trend (creation of humid condition) with none significant. Further trend analysis was carried out on the various seasons and this revealed that all the wet season (April to October) exhibits downward trend for all the regions while similar trend regime was established for dry season months (December to March) in Sahel and Guinea Savannah and upward trend for midland and the coastal or tropical rainforest. Evidence of pan evaporation paradox was also established for certain period in Nigeria.

Keywords: Pan evaporation, trend, potential evaporation, meteorological variables

JOINT STATISTICS OF RAINFALL RATE AND EVENT DURATION FOR OPTIMUM MICROWAVE LINK IN NIGERIA.

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Abstract: The Quantitative analysis of rainfall rate distribution and duration statistics of rain events are required for optimum microwave link design. In this paper, rain rates measurements using automatic weather station as well as micro rain radar at Akure, a tropical location in Nigeria are analyzed. Also, models for various event parameters are developed using the two years of continuous measurements. The average number of cases with rain event duration exhibit an exponential dependence on rainfall rate with correlation coefficient of 0.94 while the average duration for different rainfall rates follows a power law with a correlation coefficient of 0.96. The result from this study are further compared with the result obtained from temperate and some tropical locations to show the distinctiveness over the location.

Keywords: Microwave link, rain rate duration, joint distribution, tropical location.

AN EMPIRICAL ASSESSMENT ON THE PERFORMANCE OF THE INTERNATIONAL REFERENCE IONOSPHERIC MODEL OVER NSUKKA, NIGERIA USING GPS DATA

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Abstract: The International Reference Ionosphere (IRI) model has been widely adopted as the international standard for specifying ionospheric parameters. An evaluation on the performance of the IRI model over Nsukka (6.87N, 7.38E), Nigeria is presented in this work. We compare Total Electron Content (TEC) values from the IRI model with TEC data from the SCINDA (Scintillation Network Decision Aid) GPS receiver installed at Nsukka so as to evaluate the performance of the model over the region. Given the proliferation of dual-frequency GPS receivers over the African continent, data from these equipments is proposed for use in TEC modeling over the continent together with the IRI model. Knowledge on the performance of the IRI over various regions of the continent will inform the extent to which the model will be used.

GEOMAGNETIC H-COMPONENT FIELD VARIATIONS ASSOCIATED WITH E-LAYER VARIATIONS DURING SOLAR STORMS

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Abstract: We present results of a study of E-layer electron concentration measurement from a South African ionosonde taken on 15 minutes interval. Geomagnetic storms are usually associated with characteristic Dst signatures which can be observed as worldwide disturbances. E-layer responses have not been studied in this region and this ground based density variation with height presents a good condition for height profiling of the E-layer changes beginning at ~ 90km altitude. It was observed that the variation with height exhibited a considerable variations at certain heights from the weak geomagnetic storms that occurred between 2008 and Mid 2009.

COSMIC RAYS RADIATION AND SOLAR MINIMUM : RESPONSE TO EARTH'S ATMOSPHERE

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ON THE DIURNAL VARIATION OF GALACTIC COSMIC RAYS ON QUIET DAYS IN THE ROME NEUTRON MONITOR STATION

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Abstract: Fourier transformation has been performed on the time series data of the neutron monitor station in Rome (41.9^{o}N, 12.5^{o}E) to obtain the first four harmonics of its variation. The quiet day seasonal and yearly averages of diurnal variations were plotted for the station on solar cycle basis. The amplitude of the diurnal variation during solar minimum leads that of the maximum with as much as two hours. A pre-noon peak is reported for the first time (from available literature) in the annual quiet day diurnal variation at about 8:00 solar local time (SLT). This observation has never been discussed in previous and recent studies. We also established that the pre-noon peak is more visible during the solar minimum period. The seasonal variations also exhibited consistent pattern in this station. There appear to be a seasonal trend in the GCR flux correlation with sunspot number (R) where the correlation is greatest in the J-season and least in the D-season. We infer that the phase reversal is controlled by the solar polar magnetic field reversal associated with the 22-year solar activity cycle rather than the 11-year sunspot cycle. These results have significant implications for understanding the anomalies of GCR flux associations with atmospheric and geophysical forcing.

2010 GNSS WORKSHOP IN NIGERIA

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Abstract: This paper gives an account of the experience of the **GNSS** workshop, held at the UN African Regional Centre for Space Science and Technology Education in Nigeria in 2010, and perhaps highlight some of the challenges and recommended suggestions for future ones.

GEOMAGNETIC FIELD OVER AKURE FROM OBSERVATION AND IGRF MODEL

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Abstract: The geomagnetic field over Akure was investigated from direct observation and model. Geomagnetic field over Akure was monitored and measured using a locally produced magnetometer. IGRF model was used to evaluate the magnetic field over Akure at the same time epoch as the direct measurements. The measured values were compared with model values at every local time for discrepancies. Diurnal and Seasonal effects were investigated using the two means. The difference in the values were attributed to local sources captured in the direct measurements.

CONTRIBUTIONS OF VARIOUS HARMONICS TO SQ VARIATION AT ILORIN, NIGERIA

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Abstract: Description: A report is given of the investigation and the result of the harmonic analysis study of Solar quiet daily variations (Sq) in three geomagnetic elements namely the horizontal intensity (H), declination (D) and vertical intensity (Z) obtained from the MAGDAS facility at Ilorin-Nigeria- an equatorial station. Our study investigated the influence of the local effects (harmonics) on the observed variations (global effect). The Sq variations in H,Z and D at Ilorin (ILR) in West Africa (8o 29\' N, 4o 32\' E) were subjected to twenty four point numerical harmonic analysis and decomposed to extract the required harmonic amplitudes and Fourier phasing. A normalized percentage harmonic index was defined to quantify the hourly global contributions of the local effects. Results show that SqH always exhibits strong diurnal variation while SqD and SqZ have tendency for semi-diurnal or ter diurnal predominance, non of the parameters show quarter diurnal dominant contribution as indicated during the Winter, Spring and Autum of the year investigated for Ilorin. The local effects amplitudes for Winter SqD are 6.5(A2) in January, 9.62 (A3) in February, Spring value of 3.08 (A2) in April, Summer values of 5.48 (A3) in June and Autum value of 2.85 (A3) in October of 2008 to 2009. Only the Summer months of June and July of Ilorin SqZ returned predominant local amplitudes of 4.38 (A2) and 2.47(A3) with Fourier phasing values of 12.22⁰ and 42.10⁰ respectively.

GLOBAL SEASONAL VARIATION OF THE HORIZONTAL INTENSITY OF GEOMAGNETIC FIELD (H) ON SOLAR QUIET CONDITION

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Abstract: Intermagnet data obtained from www.intermagnet.org was used for this study. The data from 64 different stations at different latitudinal regions between January 1996 and December 1996 was analyzed in the study of solar quiet daily variation Sq(H). The list of the international quiet days in the year 1996 was gotten from www.ga.gov.au/oracle/geomag/iqd/_form.jsp on the internet. The (IQD's) were selected to ensure that it is only the quiet conditions that were examined. The mean for the hourly value of the five quiet days were obtained for H element and it is repeated for all the months and stations. The seasonal variation of Sq(H) was investigated; contour plots of seasonal variation were also generated using surfer and the cross sectional view of the surfer plots were also generated to illustrate the magnitude of Sq(H)nT . The months of the year were classified in to three seasons based on Llyod's season: December solstice or D-season (January, February, November& December), Equinox or E-season (March, April, September &October) and June solstice or J-season (May, June, July& August).The evaluation of the seasonal means were achieved by averaging the monthly means in each season. The results depict that the geomagnetic stations at the poles (above 65°N/S) has the highest magnitude of Sq(H), above 150nT. The equator also experienced an abnormal high magnitude (100-130)nT . It was observed that high magnitudes in Sq(H)nT at the high latitudes were pronounced at the eastern part of the globe.

EFFECTS OF HYSTERESIS BETWEEN MAXIMUM CME SPEED INDEX AND SOME SOLAR ACTIVITY INDICATORS DURING CYCLE 23

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Abstract: Using the smoothed time series of maximum CME speed index data set for solar cycle 23 we find that maximum CME speed index and some solar activity indicators show a hysteresis phenomenon. It is observed that total sunspot number, total sunspot area, solar radio flux (10.7 cm) and flare index follow different paths for the ascending and descending phases of solar cycle 23 while saturation effect exists at the maximum phase of the cycle. However we notice that the separations between the paths are not the same for the solar activity indicators we used.

RESONANCE AMPLIFICATION OF SOLAR ALFVEN WAVES BY PLANETARY TIDES

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Abstract: It is found that the Alfven waves on the Sun can resonate with the tides induced by the planets. These amplified tides could be important in solar activity such as sunspots, flares, and CMEs. This would enable long range and precise forecasting of solar activity.

SOLAR WIND ENERGY DEPOSITION THROUGHOUT THE SOLAR SYSTEM DESCRIPTION

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Abstract: The regions where the Sun's coronal magnetic field is forced open into the heliosphere by the outward pressure of plasma represents the starting point of the solar wind in the interplanetary medium. Through its movement, the solar wind deposit its energy to different interplanetary and planetary environments causing numerous processes and phenomena. This energy has 3 components - magnetic energy, thermal energy and flow. The main goal of this work is a comparison between the energy deposition by the solar wind into the different objects in the Solar system.

MULTI-TIME SCALE EVOLUTION OF GEOMAGNETIC FIELD AND IONOSPHERIC CURRENTS FROM PHILIPPINE MAGDAS DATA

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Abstract: We made a multi-time scale analysis of MAGDAS data for several stations in the Philippines. To do this, we defined time scales in minutes in powers of 10: 1 min, 10 min, 100 min = 1.6 hrs, 1,000 min = 17 hrs, 10,000 min = 7 days, 100,000 min = 70 days. We started with the largest time scale, divided it into ten parts, and found the mean magnetic field component value for each time interval. We fitted a Newton\'s polynomial through the ten points and subtracted this polynomial from the original data to obtain a filtered data in the lower time scale. We then went down to the lower time scale and repeated the process. For each time scale, we collected the filtered data of several MAGDAS stations for each magnetic field component. Between two neighboring stations, we computed the mean value of the magnetic field component, in order to virtually double the number of magnetometer stations. We then used spherical harmonic to interpolate the magnetic field far from the stations and Ampere's law to estimate the ionospheric currents above the stations. Finally, for different time scales, we plot the temporal evolution of both the geomagnetic field and the ionospheric currents over the Philippine area of responsibility.

IONOSPHERIC DELAY OF GPS L1 SIGNAL OF APRIL 2010 GEOMAGNETIC STORM

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Abstract: The delay in GPS-L1 frequency signal was studied for the April 5th to 7th, 2010 Geomagnetic Storm across high, middle and low latitude regions. The Earth's ionosphere is ascribed to be the largest source of error to GPS signals based on its composition. Free electrons are observed to be the major constituent of the earth's ionosphere, which reduce the speed of GPS signals travelling from a satellite to a ground receiver, thereby introducing errors in determining a user position. Geomagnetic storm, a space weather event, has a significant effect on the earth's ionosphere satellite systems and near-earth objects. The response of GPS-L1 frequency signal to Geomagnetic storm with effect on determining a user position was examined. Ionospheric delay was obtained from Total Electron Content with the storm intensity analyzed on time series plot. Results obtained showed that the delay suffered by GPS signals during the storm time was large and has large effect on positioning. Keywords: GPS, Geomagnetic Storm, Ionospheric Delay, Total Electron Content Corresponding.

URUGUAY IS LOCATED CLOSE TO THE CENTER OF THE SOUTH ATLANTIC MAGNETIC ANOMALY (SAMA)

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Abstract : A region where the values of the total magnetic field reach its minimum. Under this region, the exposure to hazardous cosmic is several orders of magnitudes more intense than in any other region of the planet, at least at a few hundred km. above the surface, as it has been measure from many orbiting satellites. At ground level the effect of this anomaly are less known. The solar storms can produce geomagnetic storms with important variation of the strength of the magnetic field; which it could have consequences for the tele- and radio-communications, induced currents in power lines and long pipelines, and even in several biological species.

The monitoring of the variation of the magnetic field in this critical region of the planet is relevant for the understanding of the consequences of the geomagnetic storms in our civilization.

We have been performing continuous measurements of the total intensity of the magnetic field from a new facility: the Observatorio Astronómico y Geofísico de Aiguá (OAGA). It is located at -34° 20 '0.89" S/-54° 42' 44.72" W, h: 270m. From Febraury 2011, we have used a protonic magnetometer G856 Geometrics. The measured values of total intensity of the magnetic field are the lowest compared to any geomagnetic observatory in the world. In the near future the OAGA will have also a magnetometer GSM-90F5D Over hauser and a GSM-19T Proton Magnetometer (GEM Systems).

We will present the results of the first long-term monitoring of the magnetic field at a location very close to the center of the SAMA.

INTRODUCTION OF A STUDY OF LONG-TERM VARIATION OF THE UPPER-ATMOSPHERE BY COOPERATION WITH SOLAR PHYSICS RESEARCH

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Abstract: The short description: I will introduce a study of relation between long-term variation of the upper-atmosphere and variation of the estimated solar UV radiation as a new example of researching theme in which the data of CHAIN can be effectively used.

ESTIMATION OF THE CONTRIBUTION OF SOLAR FLARE EFFECTS (SFE) IN EQUATORIAL ELECTROJET

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Abstract: Our investigation shows that SFE have significant impact on both the horizontal (H) and vertical (Z) components of the magnetic field in Huancayo, Trivandrum and Fuquene stations which are stations located in the dip equator .The variation in horizontal component is attributed to equatorial electro-jet phenomena at the dip equator.

COSMIC RAY VARIABILITY AND ASSOCIATED HELIOSPHERIC MODULATION

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University of Nigeria, Nsukka, Enugu State, Nigeria

Abstract: The diurnal cosmic ray variability of four neutron monitor stations has been studied. The quiet day variability has been obtained for almost five solar cycles (1960-2011). The search for the time of peak periods of detection along with the phase variation has revealed a number of solar activity signatures. The patterns of variation reveal strange peaks from one solar cycle to another. It is inferred that the phase reversal in all the stations are associated with solar activity cycle. Implications of this finding could contribute to the better understanding of the heliophysical modulation of cosmic rays of galactic origin.

ENVIRONMENTAL IMPACT ON ENGINEERING MATERIALS

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Abstract: Engineering materials play a vital role in our daily life and existence. Of late, there has been countless number of failed structures and equipment. We set out to investigate if the environment where the raw materials used for designing and constructing these structures has any negative role to play. This paper presents our shocking findings.

THE IMPACT OF GLOBAL WARMING ON INDUSTRIAL PRODUCTION

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Abstract: The aim of the study is to investigate the effects of global warming and the greenhouse emission on the industrial production. The work studied the industrial growth rate of ten, ten different countries over the period 8 years. It was found that it has slight effects on the industrial production of these countries.

USING GNSS TO STUDY GEOMAGNETIC STORM OF APRI 5-7 2010

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Abstract: Geomagnetic storms are driven amid other avenues by solar wind variations due to strong solar activity, with a strong effect on the ionosphere and earth systems. The 2010 April 5 – 7 geomagnetic storm is peculiar in occurrence since the last two (2) years. In this research we investigated the response of the ionosphere at the high, mid and low latitude to the geomagnetic storm and deduced the mechanism responsible for the observed ionospheric response. GPS measurements from selected International GPS Service (IGS) stations were obtained for this study, these stations cut across different geographical regions; 2 stations from the high latitudes, 8 from the mid-latitudes and 7 from the low-latitudes totaling 17 stations. Disturbed storm time (Dst) values were also obtained from the world data centre. Total electron content (TEC) which is the major composition of the ionosphere was obtained from GPS measurements using GPS-TEC analysis application software. TEC plots were obtained for the different stations using a program written in MATLAB®, likewise the Dst plots. In addition, a spatial variability map was obtained using Surfer8®. Results obtained showed that the storm commenced at 12:00 UT on 4th April 2010 with an initial phase of -30 nT, the disturbance increased into the main phase and got to a Dst value of -90 nT at 04:00 UT on April 6, and the recovery phase started from 22: 00 UT on April 7 and continued to April 10. The result showed that, at the Low-latitude region during the storm TEC values increased on April 5 and April 6 when the storm was in progress, with one of these stations experiencing a noon-time bite out. In high latitude region there was an asymmetric response to the storm, during the main phase of the storm, the northern hemisphere showed TEC depletion during the storm period indicating a negative storm response, while at the southern hemisphere TEC showed a positive ionospheric storm response.

SIMULATION OF ELECTRIC FIELD AND CURRENT DURING THE JUNE 11, 1993, DISTURBANCE DYNAMO EVENT: COMPARISON WITH THE OBSERVATIONS

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Abstract: The ionospheric disturbance dynamo signature in geomagnetic variations is investigated using the National Center for Atmospheric Research Thermosphere-Ionosphere-Electrodynamics General Circulation Model. The model results are tested against reference magnetically quiet time observations on June 21, 1993, and disturbance effects observed on June 11, 1993. The model qualitatively reproduces the observed diurnal and latitude variations of the geomagnetic horizontal intensity and declination for the reference quiet day in middle and low latitude regions, but underestimates their amplitudes. The patterns of the disturbance dynamo signature and its source "anti-Sq" current system are well reproduced in the northern hemisphere. However, the model significantly underestimates the amplitude of disturbance dynamo effects when compared with observations. Furthermore the largest simulated disturbances occur at different local times than the observations. The discrepancies suggest that the assumed high-latitude storm-time energy inputs in the model were underestimated.

2D TOMOGRAPHIC RECONSTRUCTION OF IONOSPHERIC ELECTRON DENSITY OVER ETHIOPIA

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Abstract: Two Dimensional electron vertical profile have been determined over Ethiopia along a relatively fixed longitude. We used the GPS stations to calculate the Total Electron (TEC) of the Ionosphere. A 2D, altitude versus latitude, tomography of electron density profile is determined based on a Generalized Singular Value Decomposition (GSVD) technique for inversion of the coefficient matrix from the stations. The Method of first-order Tikhonov regularization is used for stabilizing the solution.

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hosted by the Centre for Basic Space Science of the National Space Research and Development Agency (NASRDA)
on behalf of the Government of the Federal Republic of Nigeria
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2 participants had their presentation delivered by representatives
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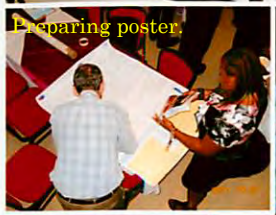

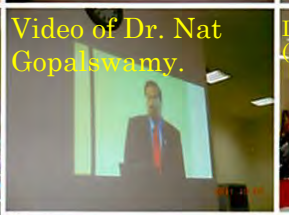

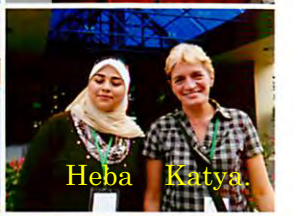

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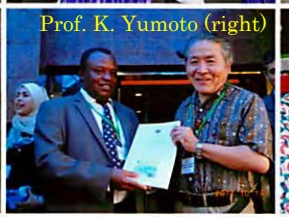

This photo collage created by G. Maeda on 28 Oct. 2011.