



IGRGEA LETTER

International Geophysical Research Group /Europe-Africa
International Geophysical Research Group /Europe-Asia

IGRGEA

At the end of the IEEY, in 1995, IGRGEA (International Geophysical Research Group Europe Africa) has been organized to follow the research work initiated during IEEY (International Equatorial Electrojet Year), in 1992. Since January 2003 IGRGEA is developing at the Institute of Geophysics in Hanoi.

BURKINA FASO

Prof Frederic OUATTARA is back from a 7 month visit to NCAR. He has been working on modeling with Dr Art RICHMOND on the ionosphere in Equatorial Africa through TIEGCM. He was financed by a Fulbright contract.

Jean-Louis Zerbo spent two months (April 15 - June 15) at Lab. of Plasma Physics, with Dr Christine AMORY-MAZAUDIER, terminating his PhD work about »Solar activity, Solar wind and equatorial ionosphere". He will read his PhD in October at Ouagadougou, Burkina Faso. He was financed by the French Ministry of Foreign Affairs.

EGYPT

Three Egyptian PhD students are from September to November in French Laboratories. They are:

Amira SHIMEIS who works at LPP with Christine AMORY-MAZAUDIER on the equatorial fountain, Ibrahim FATHY who works at LPP on the variations of the Earth's magnetic field (magnetospheric convection and

Disturbed Dynamo) and Safinaz KHALED who works at LATMOS with Dr Luc DAME on CMEs.

They have been financed by the French Ministry of Foreign Affairs.

CÔTE D'IVOIRE

Prof. Vafi DOUMBIA is in Japan for a three-month research program at Nagoya University, in the Solar-Terrestrial Environment Laboratory STEL, to work on the variations of the equatorial electrojet in the Asian sector.

France

Dr Rolland FLEURY and Dr Patrick LASSUDRIE-DUCHESNE Duchesne are preparing at the National School for Telecommunications (Brest) a training school on GPS studies of the ionosphere, October 26 to 30, 2012. This school will teach a limited number (7) of candidates all in PhD studies, coming from Algeria, Morocco, the Congolese Republic, RDC and Senegal.

ALGERIA

Prof; Naima ZAOURAR, in charge of the Algerian ISWI is organizing a teaching session on Space Meteorology in Maghreb: Algeria, Mauritania, Morocco, and Tunisia. This School will be held from May 6 to 16 2013 at USTHB (Hari Boumedienne University of Science and Technology). The Program will be announced in the next letter.



NIGERIA

Prof Babatunde RABIU and Christine AMORY-MAZAUDIER will develop a program on Space Meteorology in Bells University (Nigeria). They will be helped by many research persons who have agreed to participate to the training of Nigerian PhD Students (Dr Art RICHMOND from NCAR/USA, Dr Dieter BILITZA from NASA/USA and Dr Giannina POLETTO from INAF/Italy).

VIETNAM/ USA

Hong Thi Thu PHAM spent a month at SCAR (March 21 to April 21) with Prof. Art RICHMOND on modeling the Asian Equatorial ionosphere using the TIEGCM Model. This work concerns her PhD results on: "Regular Magnetic field variations in Vietnam and ionospheric variations"

Hong is due to read her PhD on next October 15 at the UPMC Paris University. Her work is financed by the program PNST / CNRS.

MOROCCO

Contacts are being taken for installing GPS SCINDA (Ronald CATON) and MAGDAS magnetometers (Georg MAEDA) in Morocco. The Moroccan header for this program is Prof. Anas EMRAN from the Mohammed V. AGDAL University.

Following the school of last December in Morocco, two Moroccan students will prepare PhDs on the following subjects:

- Sun and High Energy particles
- Impacts of solar events on the ionized layers

RDC : Republic Democratic CONGO

Following the September 2011 School, a research program is being elaborated for training 8 PhD students in the following domains:

- *GPS - GNSS for ionospheric studies
- *Earth's magnetic field
- *Equatorial Electrojet
- * High Energy Solar Particles
- * Physical Geography: Forest dynamics
- * Sun and Space Weather
- * GPS for Geodesy
- *Atmospheric electricity

Christine AMORY-MAZAUDIER was in RDC from August 26 to September 1 for the organization of this project. In the next letter we will present the participants to this project.

Contacts have been taken between Prof. ZANA (Kinshasa University) and Georg MAEDA (SRC) for installing magnetometers in RDC.

RC : Republic CONGO

Bienvenue DINGA (GRSEN/ University Marien NBOUABI) spent two weeks at LPP from July 25 to August 9, 2012, to work with Dr Monique PETITIDIER. He presented his work on hydro meteorology and geo chemistry of the Congo River. He is finishing his PhD and several papers. He worked also on the use of SCINDA GPS data in RC.

RCA : Republic Centre AFRICA

Tiburce CONDOMAT from University of Bangui obtained a scholarship from the French embassy at Bangui to be train in Space Weather. He will be trained by Prof. Arsène KOBÉA from the University of Cocody, Abidjan/ Côte d'Ivoire.



NEXT MEETINGS

School ISWI-MAGDAS at Bandung in Indonesia from September 17 to September 26, 2012
ISWI conference at Quito/ Equator from October 8 to October 12, 2012
Chapman conference at Addis Ababa in Ethiopia from November 12 to November 16, 2012

SOME PUBLICATIONS

Nigeria 2010-2012

Adimula I.A., Rabiou, A.B., Yumoto, K., and the MAGDAS Group, 2011. Geomagnetic field variations from some equatorial electrojet stations. *Sun and Geosphere*, **6(2)**, 45 - 49

Bolaji, O. S., Rabiou, A. B., Adimula, I. A., Adeniyi, J. O., and Yumoto, K., 2010. Inter-hemispheric Trans-equatorial Field-aligned currents deduced from MAGDAS at equatorial zone. *Space Research Journal*, 1-10.

Bolaji, O.S., A.B. Rabiou, E.O. Oyeyemi and K. Yumoto, Climatology of the inter-hemispheric field aligned currents system over Nigeria ionosphere, *Journal of Atmospheric Research and Solar Terrestrial Phys.*, <http://dx.doi.org/10.1016/j.jastp.2007-07-08>.

Rabiou, A., B., K.Yumoto, E.O. Falayi, O.R.Bello, MAGDAS/CPMN Group, 2011. Ionosphere over Africa: Results from Geomagnetic Field Measurements During International Heliophysical Year IHY. *Sun and Geosphere*, **6(2)**, 63 - 66

Rabiou, A. B., Fayose, R.S., Oladosu, O.R., and Groves, K. 2011., Variation of total electron content and their effect on GNSS over Akure, Nigeria , *Proceedings of the 62nd International Astronautical Congress*, Cape Town, South Africa, 2011, IAC-11.B2.5.2

Rabiou, A.B., Adimula, I.A., Yumoto, K., Adeniyi, J.O., Maeda, G., 2009. Preliminary Results from the Magnetic Field Measurements Using MAGDAS at Ilorin, Nigeria. *Earth, Moon, and Planets*. DOI:10.1007/s11038-008-9290-7, **104**, 173-179

Girgea 2012

Burkina Faso, Egypt, France, Ivory-Coast, Sénégal, Vietnam

Amory-Mazaudier, C., 2012, La science au service du développement, Editions l'Harmattan, ISBN 978-2-296-56969-0.

Amory-Mazaudier, C., the International Research Group in Geophysics, Europa Africa : a laboratory without borders in the Earth Science and Environment, 2012 , 6, pp 454-459.

Ndeye Thiam, Frédéric Ouattara, Gnabahou Allain, Christine Amory Mazaudier, Rolland Fleury, Patrick Lassudrie Duchesne, 2012, Variation of F2 layer critical frequency with solar cycle at Dakar station, *Vol. 11 N°2, 16-20 J. Sci. (in French)*

Ouattara, F., A. Gnabahou, C. Amory-Mazaudier, 2012, Seasonal, diurnal and solar-cycle variations of electron density at two West Africa equatorial ionization anomaly stations, *International Journal of Geophysics.*, Volume 2012, Article ID 640463, doi: 10.1155/2012/640463.

Ouattara Frédéric, Christian Zoundi, Christine Amory Mazaudier, Rolland Fleury, Patrick Lassudrie Duchesne, 2012, Determination of TEC by using pseudo range at Koudougou station in Burkina Faso, *Vol 11, N°1, 12-19, J. Sci. (in French)*

Ouattara F. and Amory-Mazaudier, 2012, Statistical study of the Equatorial F2 layer at Ouagadougou during solar cycles 20, 21, 22 using Legrand's and Simon's classification of geomagnetic activity, to appear in *Space Weather and Space Climate*.



Pham Thi Thu, H., C. Amory-Mazaudier, M. Le Huy, 2012, Model of ionospheric conductivities, to appear *Journal of Sciences of the Earth (in Vietnamese)*.

Shimeis, A., I. Fathy, C. Amory-Mazaudier, R.Fleury ,A.M. Mahrous, K. Yumoto, K. Groves, 2012, Signature of the Coronal Hole on near the North Crest Equatorial Anomaly over Egypt during the strong Geomagnetic Storm 5th April 2010, *J. Geophys. Res.*, doi:10.1029/2011JA017350, in press

Zerbo, J-L., C. Amory-Mazaudier, F. Ouattara, 2012, Solar wind and geomagnetism: Toward a standard classification of geomagnetic activity from 1868 to 2009, *Ann. Geophysicae*, 30, 421-426.

Zerbo, J-L., C. Amory-Mazaudier, F. Ouattara, Geomagnetism during solar cycle 23: Characteristics, 2012, to appear in *Journal of Advanced Research*.

Zoundi C., Ouattara F., Fleury R., Amory-Mazaudier C., Lassudrie Duchesne P, **Seasonal** TEC variability in West Africa equatorial anomaly region, *European Journal of Scientific Research*, Vol 77, n°3, pp309-319.