



## IGRGEA LETTER

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

### IGRGEA

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

The last letter, No. 56, dated May 2016

### ALGERIA

Fatma ANAD from CRAAG published a paper on the Sq observed at Medea in Algeria, by means of the magnetometer of the AMBER network coordinated by Endawoke YIGENZAW (Project ISWI). She should soon defend her thesis.

*Anad, F., C. Amory-Mazaudier, M. Hamoudi, S. Bourouis, A. Abtout, and E. Yizengaw Sq solar variation at Médéa Observatory (Algeria), from 2008 to 2011, in Advances and Space Research, doi10.1026/j.asr.2016.06029*

### COTE D'IVOIRE

Serge TANO, from Houphouët Boigny University in Abidjan, defended his thesis in Abidjan, on June 29th, on the theme:

"Study of the vertical movements of the F layer during night at the magnetic equator: the equinox transition at the minimum of solar activity", Jean-Pierre ADOHI being his supervisor. On October 9th, the Fabry Perrot interferometer of Dr. Qian WU from NCAR (National Center for Atmospheric Research) finally arrived in Cote d'Ivoire. It will be soon installed in Korhogo.



From left to right V. DOUMBIA (Côte d'Ivoire C-I), A. KOBEA(C-I), S. TANO (C-I), P. ASSAMOI (C-I), F. OUATTARA (Burkina Faso), J-P. ADOHI (C-I).

Côte d'Ivoire will organize the 3rd edition of the School of the ISWI-Maghreb-Africa school on Space Weather, from 16 to 28 October 2017 in Abidjan.

### FRANCE

The 6th edition of the school on the use of GPS for ionospheric studies (will be) is organized by Rolland FLEURY at the National School of Telecommunications in BREST from 13 to 17 February 2017. This school gathers some participants who work with GPS data of their country.

### GUINEA CONAKRY

René Tato LOUA completed his Master 2 in Remote Sensing and Natural Risks at the University of La Réunion with funding from the European Union in 2014-2015. He started a thesis in atmospheric science at the Laboratory of Atmosphere and Cyclones (LACy) of the University of La Réunion under the supervision of Pr. Hassan BENCHERIF. His subject concerns the "variability and change of dynamic and thermal structures by means of observations (ground and satellite) and numerical



*modeling: troposphere-atmospheric interactions*". His stays at LACy (One stay for about 5months/year for 3 years) are funded by the French government.

## MOROCCO

Ilyasse AZZOUZI defended his thesis on September 27th in Rabat on the theme: "*Impact of solar events on the ionization of middle and low latitudes in the European African sector.*" Ilyasse AZZOUZI was supervised by Christine AMORY-MAZAUDIER (LPP-Polytechnique-UPMC), Abderrahmane TOUZANI (EMI, Mohammed V University) and Rolland FLEURY (National School of Telecommunications Brest, France).



Other members of the Jury:

Mustapha AMGHAR, Hassan AMMOR and Mimoun HANARFI (University Mohamed V – EMI /Morocco).

Zouhair BENKHALDOUN (University Cady Ayyad of Marrakech/Morocco)

Naima ZAOURAR (USTHB/Algeria)

Jean LILENSTEN (IPAG/France),

François LEBLANC (LATMOS/France).



The national school of telecommunications in BREST (Telecom Bretagne) will install a scintillator in Rabat for the study of scintillations on GNSS signals. The cooperation is set between Rolland FLEURY (Télécom Bretagne) and Mourad BOUZIANI (the Agronomic and Veterinary Institute Hassan II (IAV)). The data will be accessible to all according to the rules of the ISWI database.

*Equipment for space meteorology installed in Morocco recently:*

(1) RENOIR, "Remote Equatorial Night Observatory of the Ionospheric Region", consists of:

- A Fabry-Perrot interferometer that measures neutral thermospheric winds and temperature at a typical mean altitude of 250 km.

-A camera that detects ionospheric irregularities such as plasma bubbles, medium-scale traveling ionospheric disturbances (MSTID) as well as gravity waves.

They were installed in November 2013 within the framework of a collaboration between the Cady Ayyad University of Marrakech and the University of Illinois at Urbana-Champaign (USA). These two instruments use the Oxygen nightglow at 630 nm and 777.4 nm and observe nearly over 1000 \* 1000 km<sup>2</sup> area above the observatory

(2) A GPS station was installed in September 2015 at the Observatory of Oukaimeden and another one was installed six months later in Marrakech.

The two GPS stations are part of a collaboration between the Cady Ayyad University and the Massachusetts Institute of Technology (MIT), USA.

Kaoula EKBOUYAHYAOU, under the supervision of Azziza BOUNHIR, began her thesis on the theme "*Studies of the impacts of CME and rapid solar winds on the thermosphere and the ionosphere region of Morocco from 2014 to 2016.*"

## NIGERIA

Instruments installed at the observatory of CAR (Center for Atmospheric Research) in Abuja

- The Fabry Perrot interferometer of Dr Qian WU, NCAR (USA)
- An optical imager from the STEL laboratory of the University of Nagoya (Japan), Kazuo SHIOKAWA,
- A magnetometer of the MAGDAS network, K. YUMOTO
- A magnetometer of the AMBER network, Endawoke YIGENZAW
- A GNSS receiver from the STEL laboratory of the University of Nagoya (Japan), Yuicj OTSUKA and Kazuo SHIOKAWA

During her visit to Nigeria (June 11-18), Christine AMORY-MAZAUDIER visited CAR in Abuja.



From left to right: Dr. Daniel OKOH, Christine AMORY-MAZAUDIER and Babatunde RABIU sitting on the roof of the observatory, in front of the lens of the optical imager of the Laboratory of research on the space environment of Abuja.

To stimulate scientific vocations among schoolgirls in Nigeria, scientific lectures were given by women scientists from Nigeria who received international prizes: Dr. Rabia SAHILU SA'ID in Atmospheric Physics and Meteorology of Space and Dr. Mojisola ADENEYI of the University of Ibadan, in the specialty Physics of the atmosphere. A QUIZ in physics was also organized. The picture below was made with the schoolgirls of the secondary school of Ochaja,

who won the first prize of the QUIZ in physics, organized by the Association 'Women in Physics' of Nigeria presided by Prof. Ibiyinka FUWAPE.



From left to right B. RABIU, schoolgirl of the school of Ochaja, Professor of the school of Ochaja, Prof. Ibiyinka FUWAPE, Christine AMORY-MAZAUDIER, and two schoolgirls of the school of Ochaja

Babatunde RABIU and Kasuo SHIOKAWA organize a school on the physics of the ionosphere in Lagos from 11 to 15 September 2017.

## RDC

Dr. Antoine BALUGA, from DRC, is assistant professor of computer science at Western Cape University, Cape Town, South Africa. He technically supports the GOMA Volcanic Observatory for data collection and transmission. He supervises Masters and theses with alternate scholarships. His research interests include the Internet of Objects (IoT), Technology of large volumes of data, distributed computing - cases of "clouds", Security and protocols of the networks with their applications wireless, networks cables and hybrids for the protection of the environment ... He is interested to be part of the GIRGEA and to collaborate in the training of young people

Kenny KALE SAYI, is in second year of thesis at the IPHC of Strasbourg. His work, on the



correlated background noise from muonic origin in the DOUBLE CHOOZ experiment, was part of the results presented during the NEUTRINO 2016 conference in London in June 2016. An oral presentation of his work will be given at the meeting of Young Researchers 2016, organized by the "Fields and Particles" and "Nuclear Physics" divisions of the French Society of Physics and held from 4 to 10 December 2016 in Angers (France). Several publications are being drafted. He is funded by the French Embassy in Kinshasa



Meal of women during the GNSS workshop

### ICTP/ITALIA

A workshop on "Use of Ionosphere GNSS Satellite Derived Total Electron Content Data for Navigation, Ionospheric and Space Weather Research", was held at the Abdus Salam ICTP Center from June 20 to 24, 2016. This workshop was attended by 40 participants, including 18 young females



#### Next meetings at ICTP

<http://www.ictp.it/>

March 27 to March 31, 2017

URSI-ICTP school on radio Physics

May 22 to June 2, 2017

Extended workshop on Space Weather effects on GNSS operation

### YVES COHEN

Our colleague and friend Yves COHEN left us on June 4, at the age of 56. He fought valiantly against a long illness, for more than two decades, always keeping his sense of humor. He participated in the International Year of Equatorial Electrojet project and trained African researchers. He was one of the founding fathers of the GIRGEA: International Group of Research in Geophysics Europe Africa. His latest publication has just been published

*"Grodgi, F., V. Doumbia, K. Boka, C. Amory-Mazaudier, Y. Cohen and R. Fleury Estimating some parameters of the equatorial ionosphere electrodynamics from ionosonde data in West Africa in Advances and Space Research, <http://dx.doi.org/10.1016/j.asr.2016.09.004>"*

