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للعلوم والتكنولوجيا
Année Franco Egyptienne de la
Science et de la Technologie



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LATMOS



Helwan University / September 19 — October 3, 2010

METEOROLOGIE DE L'ESPACE
Physique et utilisation des outils

SPACE WEATHER SCHOOL
Basic theory and hands-on experience

Rapport/ Report



Coordination de l'école par/ Coordination of the school by



Christine Amory-Mazaudier (LPP) and Ayman Mahrous (SWMC)

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Cette école a renforcé la coopération entre la France et l’Egypte en Météorologie de l’Espace : 3 étudiants ont obtenu le financement pour une thèse en alternance en France ainsi qu’une étudiante en Master.

Merci à nos sponsors : Helwan University, CNRS/DRI, Programme FEST, MICROSOFT, LPP.

This school reinforced the cooperation between France and Egypt in Space Meteorology: 3 students obtained financial support for PhD training in France and one student for master training in France.

Thank to sponsors : Helwan University, CNRS/DRI, Programme FEST, MICROSOFT, LPP.

I. INTRODUCTION : OBJECTIFS

Dans le cadre du projet international ISWI (International Space Weather Initiative <http://www.iswi-secretariat.org>) et de l'année FRANCE-EGYPTE 2010 (Damé et al., 2010¹), nos collègues Egyptiens nous ont demandé de contribuer à la formation des jeunes scientifiques de leur pays.

L'objectif principal de cette école est d'améliorer le niveau d'expertise des étudiants Egyptiens pour leur permettre de participer et contribuer aux projets internationaux. Les deux points clef sont :

- 1) la compétence pour utiliser les jeux de données déjà existants et les outils relatifs aux études d'environnement terrestre par les scientifiques égyptiens ; il existe de nombreuses données concernant l'environnement et les ressources. **On estime l'utilisation des données existantes à moins de 10%**. Ces données, en utilisant de nouvelles technologies, sont la source de travaux scientifiques originaux.
- 2) Le développement et l'utilisation, par les scientifiques égyptiens, des résultats des études alliant les sciences de l'environnement et le développement durable des ressources en combinant les données sol avec des données satellitales - par exemple pour les études de géophysiques, les télécommunications, etc...

Pour atteindre ces objectifs les cours comprendront :

- 1) Une partie scientifique pour la compréhension des mesures, des informations qui peuvent être extraites des données et des exemples d'applications dans différents domaines.
- 2) Une partie informatique sur les algorithmes utilisés, leur performance, et leur installation.
- 3) Des travaux pratiques informatiques pour l'utilisation des algorithmes et des bases de données comme SPIDR, IRI, IGRF, etc...
- 4) Une partie d'information sur les nouvelles technologies utilisées dans ce domaine comme la Grille de calcul, les services Web, les bases de données,...

Pour remplir ces objectifs, nous proposons une école permettant de découvrir et d'utiliser :

- 1) Toutes les possibilités des mesures du réseau sol de stations GPS, radar et autres instruments implantés en Egypte et dans toute Afrique :
 - a. Les études de l'atmosphère (AMMA) ;
 - b. Les études de l'ionosphère et de l'impact du Soleil sur l'environnement ionisé terrestre (Année Internationale de l'Héliosphère et projet ISWI) ;
 - c. La géodésie ;
 - d. Autres utilisations des instruments.

¹ Damé, L., A. Mahrous, C. Amory-Mazaudier, M. Petitdidier, A. Hady, Météorologie de l'Espace en Afrique (1) Année Franco-Egyptienne de la Science et de la Technologie 2010, papier invité, REE 6/7 (juin juillet) 2010.

- 2) Les systèmes d'information géographiques qui permettent la gestion et la visualisation des données spatiales dans tous les domaines.
- 3) Le développement de bases de données locales et l'utilisation des bases de données existantes via internet et une introduction aux nouvelles technologies.

Cette école a pour objet de développer l'analyse de données en Afrique et ainsi de rentabiliser de nombreux projets existant.

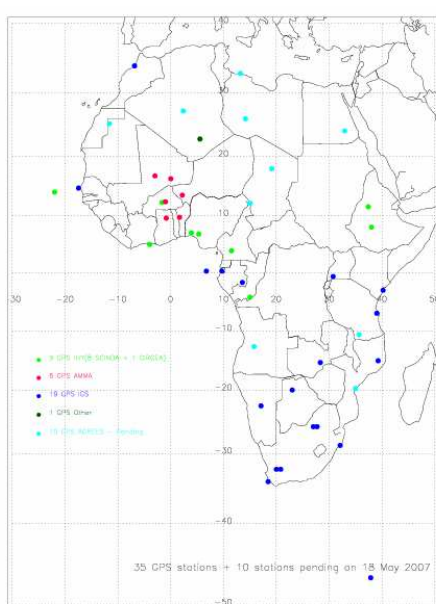
II. MOTIVATIONS

1. Réseaux d'instruments en Afrique

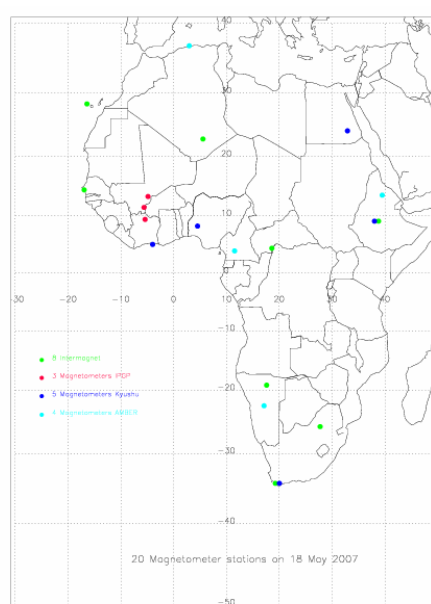
Après le projet « Année Héliophysique Internationale (AHI- <http://ihy2007.org>) 2007-2009, le programme International Space Weather Initiative (2010-2012) continue le développement des réseaux d'instruments sur le continent africain et notamment des réseaux de stations GPS et de magnétomètres, de radars, etc....

Le GIRGEA (Groupe International de Recherche en Géophysique Europe Afrique <http://www.girgea.org>) a été sollicité par les chercheurs étrangers pour les aider à développer le projet AHI en Afrique et aujourd'hui le projet ISWI grâce au réseau de compétence construit par le GIRGEA, depuis plus de 19 ans.

La contribution des équipes françaises au projet ISWI se fait via d'autres programmes nationaux (IPGP, Institut de Physique du Globe de Paris -> réseau de 3 magnétomètres en rouge figure de droite) ou internationaux (AMMA, Analyse Multidisciplinaire de la Mousson Africaine -> réseau de 6 GPS en rouge figure de gauche).



réseaux de stations GPS



réseaux de magnétomètres

Lors d'un atelier de travail, organisé par AHI à Addis Abeba en Ethiopie, en novembre 2007, le GIRGEA, chargé d'organiser la coordination des stations GPS sur l'Afrique, a fait un point de la situation. L'étude menée a montré que les stations GPS peuvent être utilisées pour des études scientifiques dans des domaines variés :

- Ionosphère étude du contenu Total en électrons (TEC), scintillations, etc...
- Atmosphère - étude de la mousson -> contenu intégré de l'humidité dans la troposphère
- Géodésie -> tectonique des plaques
- Positionnement des satellites -> navigation, télécommunications en zone tropicale et équatoriales
- Géographie -> cartographie
- Etc...

En zone tropicale et équatoriale, il est nécessaire de connaître les contributions de l'ionosphère (*couche ionisée entourant la terre et située entre 90 et 500 km*) et de l'atmosphère au signal GPS pour toutes les applications, car l'ionosphère et l'atmosphère modifient fortement le signal GPS.

2. Système d'Information Géographique (SIG)

Les SIG sont déjà très utilisés en Afrique dans de nombreux domaines en dehors de la recherche; aussi dans beaucoup de pays Africains une compétence et des formations universitaires à différents niveaux se sont développées.

Dans le cadre de cette école, il sera aussi montré des possibilités d'utilisation dans les divers domaines.

La formation sera basée sur des SIG-outils usuels, ArcGIS, avec les composantes ArcMap, ArcCatalog, ArcToolbox), ainsi que sur les manipulations du GPS pour des applications variées (environnement, forêts, santé, transport, urbanisme,..). Des logiciels « Open Source » seront aussi présentés.

3. Nouvelles technologies

L'adoption des technologies de l'information et de la communication (TIC) et l'accès à l'Internet sont en pleine expansion en Afrique, mais à cause de leur accroissement rapide partout dans le monde, la fracture numérique entre l'Afrique et le reste du monde persiste, et l'écart s'accroît. Aussi il est important d'informer et de former les scientifiques et étudiants sur les bases de données (création et utilisation de celles existantes), la surveillance du réseau Internet afin de vérifier son évolution, et l'accès aux calculateurs et à la grille de calcul pour leur permettre d'exploiter leur données, de faire tourner leur simulations, et de collaborer avec des équipes du monde entier.

4. Formation : ECOLE de METEOROLOGIE DE L'ESPACE

Il a été aussi demandé à tous les participants de cet atelier de travail, AHI/IHY, de renforcer la formation en Afrique et notamment la formation à l'utilisation des données des stations GPS pour les différentes applications possibles. Déjà deux écoles de formation ont été mises en place pour la zone anglophone :

- une formation à l'utilisation des données GPS et outils SIG ;
- une formation aux 'Space Sciences' dans le cadre du projet ISWI coordonnée par la commission des applications pacifiques de la science à l'Espace de l'ONU ;
- un tutorial sur les nouvelles technologies : Grille de calcul, serveur de données, internet, ressources de calcul intensif et de Grille de calcul...

5. Le Projet

L'école s'adresse à 60 participants des secteurs des Universités d'Helwan (Egypte). Les participants retenus doivent avoir déjà des bases en informatique et en base de données.

Cette école a pour objectif de permettre aux participants de :

- Maîtriser la manipulation du GPS et les étapes de recueil de l'information sur le terrain ;
- Maîtriser l'exploitation des données GPS selon leur domaine de compétence ;
- Maîtriser les fonctionnalités de bases et avancées des SIG ArcGIS, Arc view, et autres logiciels courants ;
- Favoriser la synergie entre le SIG et le GPS.

Au terme de cette formation, les participants doivent être à mesure de :

Pour le GPS

- Savoir utiliser un GPS (différentes fonctionnalités de l'instrument, installation) ;
- Savoir prendre en charge : enregistrement, identification, stockage, recherche des coordonnées de points sur le terrain, report de points, etc... ;
- Savoir exploiter les résultats pour des études de l'atmosphère, de l'ionosphère et en géodesie ;
- Connaître les différents domaines d'application pratique.

Pour les SIG

- Constituer une base de données géographiques (ouverture et création de couches, scannage, digitalisation, structuration et organisation des données géographiques, modification ou suppression d'objets graphiques, changement de coordonnées et manipulations des systèmes de projection, géo-référencement, intégration des points GPS dans un fond de carte existant) ;
- Réaliser des analyses thématiques et analyses spatiales (manipulation des opérateurs vecteurs et raster, création zones tampons, requêtes divers, restitution cartographique) ;
- Connaître les équivalences entre logiciels (principes et terminologie).

- Références : www.univ-lr.fr/formations/pro/lpsig/bibliographie.htm

Pour les GPS et les SIG

- Connaître les bases de données intéressantes dans les divers domaines abordés ;
- Savoir accéder aux bases de données GPS, GIS et autres ;
- Savoir utiliser les données et outils disponibles sur les bases sélectionnées.

Pour les nouvelles technologies

- Connaître les ressources de calculs disponibles et les techniques sous-jacentes ;
- Savoir comment créer des bases de données et les portails pour y accéder ;
- Avoir un support technique pour la surveillance du réseau ;
- Participer et collaborer à l'effort mondial des nouvelles technologies, en particulier l'effort Européen.

Les applications pratiques devront être basées sur des données thématiques variées et concerner les domaines d'intérêt national.

Une analyse des besoins ciblés des participants et de leur niveau sera faite dès l'ouverture des inscriptions.

Les participants seront des étudiants de maîtrise, des thésitifs et du personnel universitaire ou d'autres organisations nécessitant aussi cette formation.

III. INTRODUCTION: OBJECTIVES

In the framework of the ISWI (International Space Weather Initiative, <http://www.iswi-secretariat.org>) project and of the France-Egypt Year in 2010 (Damé et al., 2010²), Egyptian colleagues requested the contribution of French scientists involved in the space weather field and related domains to the training of young Egyptian scientists. We have proposed then to organize a Space Weather school.

The main objective of this school is to increase the level of expertise of the Egyptian students in order for them to participate and contribute to international programmes. Then the two important key points of this school are:

- 1) The ability to use already existing data sets and tools related to the Earth's environment by the Egyptian Scientists. There are a lot of existing data on environmental and natural resources and less than 10% of these data are used. Those data, using new technologies, are a source of original scientific work.
- 2) The development and the use, by Egyptians Scientists, of results connecting Environmental Sciences and sustainable development by using data from instruments ground-based as well as onboard satellites for geophysics, telecommunications, etc...

To reach these objectives the lectures will include:

- 1) a scientific part necessary to understand the observations and their data processing, and applications using them in different disciplines;
- 2) an informatics part on the algorithms, their performance and their installation;
- 3) a training part on computer for the use of algorithms and data bases as SPIDR, IRI, IGRF, etc...
- 4) an information part on new technologies in use in this field like Grid, Web services, databases, monitoring of network...

To fulfil those objectives in the school we propose the following topics:

- 1) the network of GPS stations, radars and other tools installed in Egypt and in other place of Africa:
 - a) to study the meteorological atmosphere (AMMA);
 - b) to study the ionosphere and the impact of the sun on the ionised Earth's environment (IHY International Heliophysical Year and ISWI);
 - c) to study geodesy;
 - d) other application domains;
- 2) the geographic information system (GIS) which allows the management and the visualisation of spatial data in many domains;
- 3) the development of local data bases, the use of existing data bases via internet and the initiation to the new technologies.

² Damé, L., A. Mahrous, C. Amory-Mazaudier, M. Petitdidier, A. Hady, Météorologie de l'Espace en Afrique (1) Année Franco-Egyptienne de la Science et de la Technologie 2010, papier invité, REE 6/7 (juin juillet) 2010

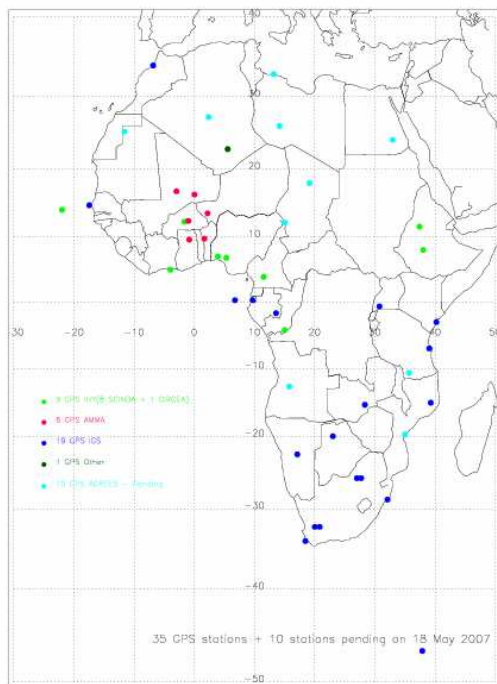
IV. MOTIVATIONS

1. Networks of scientific tools in Africa

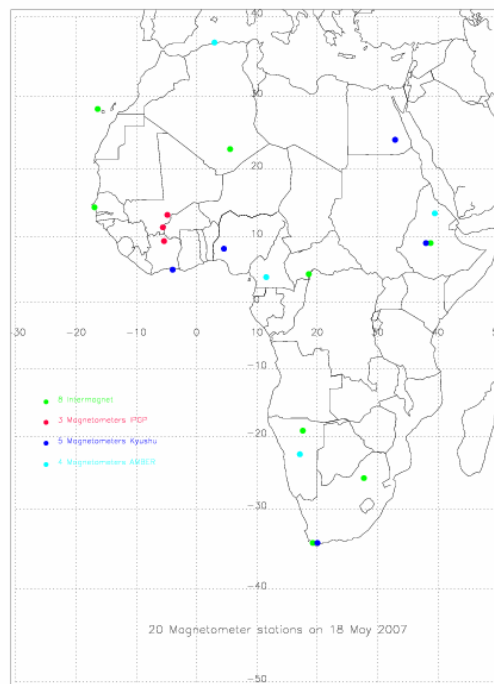
After the “ International Heliophysical Year 2007-2009 (IHY – <http://ihy2007.org>), the International Space Weather Initiative (2010-2012) ISWI programme pursues the development of networks of scientific instruments over the African continent and particularly networks of GPS, magnetometers, radars, etc.... (see Annex 1).

During the IHY programme (2007-2009), the IGRGEA (International Group of Research in Geophysics Europe Africa <http://www.girgea.org>) was solicited by foreign scientists to help them to develop cooperation with African scientists. After IHY, the cooperation is pursued in within the ISWI programme (2010-2012).

The contribution of the French teams to the ISWI projects is made through national programmes (IPGP: *Institut de Physique du Globe de Paris* -> network of 3 magnetometers in red on the right figure) or international (AMMA: *Multidisciplinary Analysis of the Africa, Monsoon* -> network of 6 GPS in red on the left figure).



Networks of GPS stations



Networks of magnetometers

During the IHY programme workshop, at Addis Abeba in November 2007, the IGRGEA has been in charge of organizing the coordination of the different GPS networks over Africa and to evaluate the situation of the GPS stations in Africa. This given study highlights that GPS stations can be used for scientific studies in many various disciplines:

- Ionosphere: study of the Total Electron Content (TEC), scintillations, etc...

- Atmosphere: study of the total content of water in the troposphere
- Geodesy -> tectonic
- Positioning of satellites -> navigation, telecommunications in equatorial and tropical zones
- Geography -> map
- Etc...

In tropical and equatorial zones it is necessary to know the contribution of both the ionosphere (*ionised layer around the Earth between 90 and 500km*) and the atmosphere to the GPS signal for all the applications due to the modification of the GPS signal by ionosphere and atmosphere.

2. Geographic Information System

The Geographic Information System are very often used in Africa in various societal areas and in the research ones; in many African countries there are expertise in this field, courses and training on GIS in the Universities at different levels.

In the framework of this school, the possibilities of the GIS will be presented and applied to the different disciplines.

The training will be based on the use of GIS tools , ArcGIS (with its components ArcMap, ArcCatalog, ArcToolbox) with GPS for various applications (forestry, health, transport urbanism, etc...). Open source softwares will also be presented.

3. New technologies

Adoption of information and communication technologies and access to the Internet is expanding in Africa, but because of the rapid growth elsewhere, a Digital Divide between Africa and the rest of the world exists, and the gap is growing. Then it is important to inform and train the students and scientists on the databases (creation and access to existing one), on the monitoring of the internet network in order to check its evolution, and on the access to HPC (High Performance Computer) and Grid in order to exploit their data, to run their simulation and collaborate with worldwide teams.

4. Training: SCHOOL OF SPACE WEATHER

It was also required from all the participants at the Adis Abeba workshop of the IHY programme to increase training in Africa and particularly training on the use of GPS data for all the possible applications and its related domains. Two schools occurred on the African Anglophone zone and one on the African Francophone zone on the following topics:

- Training on the use of GPS data and GIS;
- Training on 'Space Sciences' in the framework of the scientific programmes IHY and ISWI coordinated by the commission for the peaceful applications of science to the outer space of UN;

- Training on new technologies: database, Web services, data ‘server’, internet, HPC and Grid computational resources.

5. Project

The school concerns 60 participants of the various disciplines of the University of Helwan (Egypt). It is required for the selected participants to have a basic knowledge in computers and data base.

The objectives of the school are to allow all the participants:

- to master the use of GPS and know all the steps to record data;
- to master the exploitation of GPS data following their domain of expertise;
- to master all the basic functionalities of advances on GIS, ArcGIS, Arc view and other usual software;
- to encourage synergies between GIS and GPS;
- to take advantage of all available or possible computational resources (HPC, Grid).

After this training the participants should know the following things:

For GPS

- o To use the GPS (different functionalities of the instrument, installation);
- o to handle GPS data: record, identification, data storage, coordinates of the data points on the ground, transfer of data points, etc...;
- o to exploit the data for studies in atmosphere, ionosphere or geodesy;
- o to know the different fields of application of GPS.

For SIG

- o To constitute a geographic data base (opening and creation of layers, scans, digitalization, structuring and organization of geographical data, modification or suppression of graphical objects, change of coordinates and use of projection systems, geo-referencing, integration of GPS points on an existing map);
- o to realize thematic and spatial analysis and (use of the vector operator and raster, creation of, requests, restitution cartographic);
- o to know the equivalences between software (principles and terminologies);
- o References: www.univ-lr.fr/formations/pro/lpsig/bibliographie.htm.

For GPS ad SIG

- o To know the interesting existing data bases in the different domains studied;
- o To access data bases like GPS, GIS and others;
- o To know the use of data and tools available on the selected data bases.

For New Technologies

- o To be aware of compute resources available and their underlying technics;
- o to know how to create databases and portal to access them;
- o to have support for network monitoring;

- o to participate and collaborate to worldwide effort for new technologies, in particular European ones.

The practical applications will concern various thematic data in domains of national interest.

The specific needs and the knowledge level of each participant will be evaluated during the registration process at the school.

The participants are students at Master level, doctorate or post-doc and personnel from university or other organizations needing this training.

V. LECTURES

GIS

Télésphore Brou

Université d'Artois - Faculté d'Histoire et Géographie, Arras, France



- Basic concepts and theory of GIS
- Structuration of a geo referenced data base
- Presentation of a structured data base on line : SIEREM
- Map reference with GPS
- Integration of GPS data to SIG
- Request and geo statistic analysis
- Handling of a SIG (Map Info or ArcGis)
- Presentation of an Open Source : Mapwindow
- Extraction of pictures from Google Earth, to manage and bear and integrate geo references in a SIG
- Software SIG MapInfo preferentially or ArcGis
- GPS Garmin preferentially

ARCGIS data Modeling
Maroun Mounzer - ESRI, USA
Workshop Outline:
Time Topic

14:00 – 14:30	1. Introduction to ArcGIS and Geodatabase Concepts
14:30 – 15:00	2. GIS Requirements Review/Validation/ Analysis
15:00 – 16:30	3.Data Modeling – Conceptual Design
16:00 – 16:30	Break
16:30 – 17:00	4. Data Modeling – Logical Design
17:00 – 17:30	5. Data Modeling – Physical Design
17:30 – 18:00	6. Geodatabase configuration and Testing - a.Data Evaluation - b.Source Data Matrix - c.Data Conversion Methodology and Specifications - d.Geodatabase Configuration - e.Pilot Testing and Model Revisions - f.Data Model Documentation
18:00 – 18:30	7. Geodatabase Development - a.Data Conversion/Migration - b.Data QA/QC and Loading - c.Training and Deployment
18:30 – 19:00	8. Questions and Closing Remarks

Geodesy
Frédéric Masson
Institut de Physique du Globe de Strasbourg, France



During the first part of the training, we will introduce the GPS system. This part will be done conjointly with O. Bock in charge of the atmospheric part of the training.

In the second part we will focus on the use of the GPS in the earth sciences and more especially in the solid earth studies (mainly plate movements, plate tectonics and seismic cycle). Examples from Turkey and Afar will illustrate these lectures. A short view of the other geodetic techniques for the solid earth studies will be proposed.

Finally we will make some practices:

- 1- Use of a GPS receiver, extraction of the data, conversion, quality check
- 2- Use of the data bases.
- 3- Computation of a velocity field from a set of data (example of the Afar region)
- 4- Seismic hazard computations helped by GPS data (example of the Anatolian fault).

Meteorology Olivier Bock

Laboratoire de Recherche en Geodésie / Institut Géographique National, France



The lecture will focus on modelling the GPS signal propagation in the troposphere and the processing of data in geodetic mode and estimation of tropospheric parameters (zenith delays, gradients) along with station position. The correlation between zenith tropospheric delays and station height will be emphasized. The impact of changing models (e.g. troposphere) and the impact of un-modelled or mismodelled

error sources like antenna phase centre variations, multipath, site displacements due to loading effects on station position and zenith tropospheric delay estimates will be studied. Finally, examples of applications of ground-based GPS network in atmospheric sciences and operational weather forecasting will be presented.

Content of lecture:

1. Introduction
2. Tropospheric delay modelling
3. GPS processing
4. Correlation between ZTD et height
5. GPS meteorological applications

The practical courses will consist in:

1. Making observations with a dual frequency GPS receiver and computing its position using a commercial software
2. Processing a baseline with data from permanent receivers using a scientific software
3. Analyzing zenith tropospheric delays available from the IGS web server for permanent GPS stations.

Schedule:

Lecture (Monday 20th, 14:00-15:30): first part (Chapters 1 to 3)

Practical course No.1 (Monday 20th, 16:00-19:00): The use of a GPS receiver

Practical course No.2 (Tuesday 21st, 16:00-19:00): GPS data processing

Lecture (Wednesday 22nd, 11:00-12:30): second part (Chapters 4 and 5)

Practical course No.3 (Thursday 23rd, 11:00-12:30): Products and analyses

Ionosphere
Patrick Lassudrie Duchesne and Rolland Fleury
Telecom, Brest, France



Cours 1 : Introduction to GNSS (GPS, GLONASS, Galileo, ...) (3 h)

Cours 2 : The propagation Earth-satellite : Influence of the Earth atmosphere (troposphere, ionosphere) (2h),

TP :

- Use of the ionospheric data bases : GPS Measurements (files RINEX), ionosonde measurements (SPIDR, ULCAR) (4h)
- GPS ionospheric map (IONEX) (1h)

Lecture and TP ionosphere

Lecture 1 : Introduction to the Global Navigation Satellite System (GNSS)

- ⌚ Radiolocation systems
- ⌚ GPS
 - o System overview
 - o Space, control and user segments
 - o Satellite signals
 - o Receiver position and time
 - o Measurement errors
- ⌚ Atmospheric effects on signal propagation
 - o Ionospheric effects
 - o Tropospheric effects
- ⌚ Data processing
 - o Model correction
 - o Dual frequency correction
 - o Relative positioning
 - o Code and phase measurements
- ⌚ Future GNSS
- ⌚ Conclusions

Lecture 2: Earth-space propagation

- ⌚ The terrestrial atmosphere
 - o Nomenclature
 - o The standard atmosphere
 - o Refractive effects
- ⌚ Effects of the troposphere on propagation
 - o Path length increase
 - o Attenuation due to atmospheric gases
 - o Tropospheric scintillation
 - o Attenuation due to hydrometeors
- ⌚ The ionosphere

- o Morphology
- o Solar terrestrial relationships
- o Ionospheric perturbations
- ⌚ Effects of the ionosphere on propagation
- o Plasma frequency
- o Refractive effects
- o Faraday effects
- o Ionospheric scintillations
- ⌚ Summary

Sites Web used

IGS Central bureau : <http://www.igs.org/index.html>

(onglets : Mail + Tracking Network)

Data 1 (USA) : <http://sopac.ucsd.edu/>

Data archive + Network

Data 2 (NASA) : <ftp://cddis.gsfc.nasa.gov/pub/gps/>

Data 3 (France) : <ftp://igs.ensg.ign.fr/pub/igs/>

Data 4 (Allemagne) : <http://igs.bkg.bund.de/index/index>

Data 5 (USA) : <http://www.unavco.org/>

Data 6 (USA) <http://www.ngs.noaa.gov/CORS/download2/>

IGS Central bureau : <ftp://igsb.jpl.nasa.gov/>

Onglet : pub/data/format : rinex , sinex, sp3, ionex (explique les formats)

Rinex 2.10 : <http://www.ngs.noaa.gov/CORS/instructions2/>

Hatanaka compression

<http://www.ngs.noaa.gov/CORS/software/>

<ftp://terras.gsi.go.jp/software/>

GPS calendar : sopac/other

<http://www.ngs.noaa.gov/CORS/instructions3/>

ALMANACS :

<http://www.navcen.uscg.gov/gps/almanacs.htm>

IONEX :

Codg : <ftp.unibe.ch/aiub/CODE/2010>

IRI

Modèle en ligne : <http://modelweb.gsfc.nasa.gov/models/iri.html>

IONOSONDES :

Mesures verticales : <http://spidr.ngdc.noaa.gov/spidr/>

Ionogrammes temps réel : <http://umlcar.uml.edu/DIDBase/>

Utilities : TEQC : the Facility's "translate, edit, quality check" program
(<http://facility.unavco.org/software/software.html>)

Solar and Heliospheric Physics
Luc Damé – LATMOS/IPSL- CNRS, France



The Solar and Heliospheric Physics course is divided in 5 lectures and includes a visit to the Helwan Observatory (where a H-Alpha Solar Activity Monitoring Station is being installed), either the Wednesday 29 or the Saturday October 2. Each lecture is planned for 1h30.

LECTURE 1 – Tuesday 28

It shines

- 1.1 - The Sun, a star that shines
- 1.2 - Some tools for solar plasma diagnostics

LECTURE 2 – Tuesday 28

It shapes

- 2.1 - The solar magnetic field
- 2.2 - Structure of the solar atmosphere

LECTURE 3 – Wednesday 29

It shakes

- 3.1 - Activity and Solar Eruptive Events
- 3.2 - Process release of magnetic energy

It heats

- 3.3 - Heating of the solar corona

LECTURE 4 – Saturday 2

It moves

- 4.1 - The solar wind: energy balance, simple model of Parker, fast Wind and transport of energy in the solar wind
- 4.2 - Transients in the heliosphere

It impacts

- 4.3 - Dynamics and global electrodynamics of the magnetosphere and ionosphere

LECTURE 5 – Saturday 2

It observes

- 5.1 - Optical principles of spectroscopy and solar monitoring applications
- 5.2 - Data bases in Solar Physics and basis of data treatment

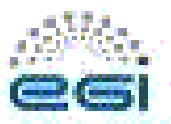
Data Base
Mikhail Zhizhin- GCRAS, Russia



The Space Physics Interactive Data Resource (SPIDR) (<http://spidr.ngdc.noaa.gov>) is a de facto standard data source for solar-terrestrial physics, functioning within the framework of the World Data Center System. It is a distributed database and application server network, built to select, visualize and model historical space weather data. SPIDR can work as a fully-functional web-application (portal) or as a Grid of web-services, providing functions for other applications to access its data holdings.

Currently SPIDR archives include solar activity and solar wind data, geomagnetic, ionospheric, cosmic rays, radio-telescope ground observations, telemetry and images from NOAA, NASA, and DMSP satellites. SPIDR portals, databases and services are installed in the USA, Russia, China, Japan, Australia, South Africa, France and Ukraine. SPIDR has more than 20 000 registered worldwide users and daily load of about 100 user sessions per site. SPIDR technology has proven to be useful for environmental data sharing, visualization and mining, not only in space physics, but also in diverse environmental arenas such as seismology, GPS measurements, tsunami warning systems, and others.

The hands-on training will include basic course for interaction with the SPIDR web portal as well as in-depth lessons for web service use with SOAP and REST clients (Java, Matlab, IDL), installation and management of a SPIDR node, database architecture, and metadata management in SPIDR Virtual Observatory



**Heavy computations,
how can grid help you
Thursday 30 September 2010**



Grid Day

Convener: Monique Petitdidier LATMOS/IPSL - CNRS, France



9h-9h15 WELCOME (15min)

9h15- 9h45 INTRODUCTION (30min)

Web, Grid and cloud computing, HPC... Dr Mikhail Zhizhin (GCRAS-Russia) (30 min)

9h45- 10h45 INTERNET NETWORK (1h)

- Network in Egypt Eng. Majid Al-Sadek (Egyptian National STI network) (30min)
- The World Football Cup, Africa and Internet performance: Dr L. Cottrell (SLAC, USA) – 30min

Pause

11h15- 12h15 RESOURCES AVAILABLE IN EGYPT(1h)

- HPC, Grid in Egypt: Prof. Salwa Nassar (NARSS & ERI) 30min
- EGI – Monique Petitdidier (IPSL/LATMOS - CNRS, France)

30min

- How to access the resources - demonstration Dr Salwa Nassar & Eng. Maha Dessouky

12h15 -12h30 Short Round table with the previous speakers to answer assistance questions

14h-16h GRID APPLICATIONS ACTIVITIES (2h)

CMS –Dr A. Radi (SWMC) + I. Semeniouk (LLR/IN2P3 -France) **1h10**

- What is the CMS experiment & participation of Egypt
- Demonstration on Grid

Earth Science: **1h**

- Earth Science applications on Grid: Dr Monique Petitdidier

- Demonstration of a Helwan University application : Dr A. Radi

Pause

16h30-18h FUTURE ACTIVITIES

Space Weather Monitoring Center (SWMC) needs in terms of informatics resources related to projects: Dr. A. Mahrous (30min)

EUMEDGRIDSsupport Activity: (30min) Dina Barakat (Egyptian University Network)

EPIKH and Linksceem 2 Prof. Salwa Nassar (NARSS & ERI) 15-30min

18h-19h: Round table with all the speakers for final conclusions

Lectures on the Internet and Mobile Computing
Dr. Les Cottrell - SLAC, USA



1. The Internet, the world cup and Africa, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/helwan10.pptx>

Thursday 30th September, 10:15-10:45am Grid Day

- o Methodology
- o Current State
- o What is happening?
- o Impact
- o Next Steps

2. Internet History, trends and futures, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/internethistory.pptx>

Sunday 26th September 9:00-9:45am

- o Brief history
- o Design goals
- o Growth & Success
- o Current challenges
- o Internet NG
- o What is driving the changes

3. How is the Internet performing, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/perform.pptx>

Sunday 26th September 9:45-10:30am

- o Internet characteristics
- o Users, capacities, satellites, packet sizes, protocols, routing, flows
- o How is it used apps etc.
- o How the Internet worldwide is performing as seen by various measurements and metrics
- o Application requirements

4. Cell Phones, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/cellphone-work.pptx>

Monday 27th September, 9:00 - 9:45am

- o Not covering Cordless phones, CB radios, pagers, car phones, Iridium etc.
- o How they work
- o History
- o Cell phone components
- o Power
- o Carriers
- o Coverage

- o Bars
- o Growth
- o Concerns

5. Smart phones & other Mobile computing, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/smartphones.pptx>

Monday 27th September, 9:45 - 10:30am

- o Wireless
- o What is a smartphone and their growth
- o Why are they important
- o How are they used
- o What's coming
- o Bandwidth impact
- o Not for everybody yet
- o Laptops & Netbooks
- o Smartbooks
- o Tablets
- o WiFi
- ⌚ How it works
- ⌚ Protocols
- ⌚ WiFi and smartphones

6. Diagnosing network problems for non-networkers, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/diagnosing.pptx>

Wednesday 29th September, 16:00 - 17:30pm

- o Goal: provide a practical guide to debugging common problems
- o Why is diagnosis difficult yet important?
- o Local host
- o Ping, Traceroute, PingRoute
- o Looking at time series
- o Where is a node
- o Who do you tell, what do you say?
- o Case studies and More Information

7. Network Measurements, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/internetmeasure.pptx>

Wednesday 29th September, 17:30-19:00pm

- o Why is measurement important?
- o LAN vs WAN
- o Passive
- ⌚ SNMP, Netflow
- ⌚ Effects of measurement interval
- o Active
- o Tools various
- ⌚ Ping, traceroute
- ⌚ Available bandwidth, achievable bandwidth
- o PingER

Others

Probably we will not cover the items below due to lack of time.

1. Geolocation, see

<http://www.slac.stanford.edu/grp/scs/net/talk10/geolocation.pptx>

- o Importance
- o How is it done
- o Dynamic method
- ⌚ RTT => distance
- ⌚ Geometrical methods of finding location from circles
- o Application
- o Challenges

2. Internet case studies

- o Digital Divide and Africa (some of this will be covered in the Grid Day presentation)
- o Cable cuts
- o Impact of TEIN3
- o Pakistan

3. How does the Internet work, see

<http://www.slac.stanford.edu/grp/scs/net/talk09/ictptcpip.ppt>

VII. SCHEDULE

FIRST WEEK (19 – 25 September)

	SUNDAY 19	MONDAY 20	TUESDAY 21	WEDNESDAY 22	THURSDAY 23	FRIDAY 24	SATURDAY 25
09h00 – 10h30	MATLAB	Opening Ceremony	Lecture n°5: GPS and Reference System (FM)	Lecture n°6 GPS/meteorology (OB)	PW: GPS meteorology – Products and analyses (OB)	Free day (Excursion)	Lecture n°7: GPS and tectonics (FM)
10h30 – 11h00	Coffee						
11h00 – 12h30	MATLAB	Lecture n°1 GPS: Introduction Pr F. Masson (FM)	PW: The use of a GPS (FM+OB)	PW: GPS data processing (FM+OB)	PW: GPS meteorology-Products and analyses (OB)		PW: GPS/tectonics (FM)
12h30 – 14h00	Lunch						
14h00 – 15h30	MATLAB	Lecture n°2 GPS/Meteorology Pr O. Bock (OB)	PW: The use of a GPS FM+OB	PW: GPS data processing (FM+OB)	PW: GPS/ionosphere (PLD-RL)		PW: SIG (TB)
15h30 – 16h00	Coffee						
16h00 – 17h30	Inscriptions	Lecture n°3 GPS / Ionosphere Pr. Lassudrie-Duchesne (PLD)	PW: the use of GPS/ionosphere (PLD), Pr R. Fleury (RL)	PW: SIG (TB)	PW: GPS/ionosphere (PLD-RL)		PW: SIG (TB)
17h30 – 19h00		Lecture n°4 SIG Pr. T. Brou (TB)	PW: GPS/ionosphere (PLD-RL)	PW: SIG (TB)	PW: GPS/ionosphere (PLD-RL)		PW: SIG (TB)

PW: Practical Work

SECOND WEEK (September 26 – October 2)

	SUNDAY 26	MONDAY 27	TUESDAY 28	WEDNESDAY 29	THURSDAY 30	FRIDAY 1st	SATURDAY 2
09h00 – 10h30	Network Dr. Les Cottrell (LC)	Network (LC)	Solar Physics Lecture N° 1 Dr. Luc Damé (LD)	Data Base (MZ)	Grid Dr. Monique Petitdidier (MP)	Free Day (Visit NARSS?) to	Solar Physics Lecture N° 3 (LD)
10h30 – 11h00	Coffee break						
11h00 – 12h30	Network (LC)	Network (LC)	Solar Physics Lecture N° 2 (LD)	Data Base (MZ)	Grid (MP)		Solar Physics Lecture N°4 (LD)
12h30 – 14h00	Lunch						
14h00 – 15h30	Data Base Pr. Mikhael Zhizhin (MZ)	ArcGis data Modeling Mariun Mounzer (MM)	Data Base (MZ)	Visit of Helwan Observatory Solar Physics (LD)	Grid (MP)		Solar Physics Lecture N°5 / PW: Solar data base & data treatment (LD) PW
15h30 – 16h00	Coffee break						
16h00 – 17h30	Data Base (MZ) PW	ArcGis data Modeling (MM)	Data Base (MZ) PW	Network (LC) PW	Grid (MP)		
17h30 – 19h00	Poster Session	ArcGis data Modeling (MM)	Visit Space Weather Monitoring Center	Network (LC) PW	Refreshments		

PW: Practical Work

VIII. POSTER



Space Weather Monitoring Center



الأكاديمية الفرنسية للعلوم والتكنولوجيا
Année France Egyptienne de la Science et de la Technologie



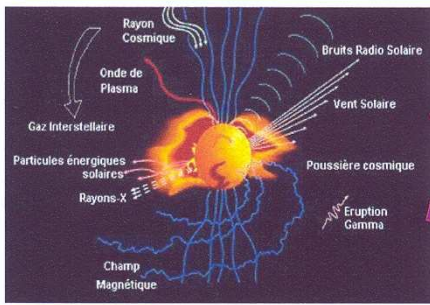
Laboratoire de Physique des Plasmas

2010 ANNEE EGYPT-FRANCE
METEOROLOGIE DE L'ESPACE / SPACE WEATHER

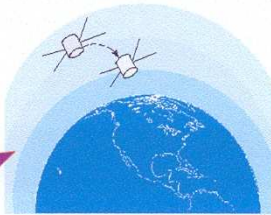
Space Weather Monitoring Center/ <http://www.helwan.edu.eg>

Laboratoire de Physique des Plasmas/ <http://www.lpp.fr>

Vie de tous les jours
Daily life



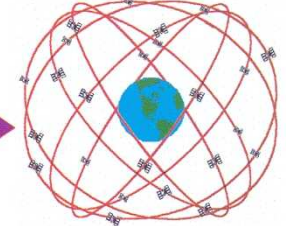
Le soleil agit sur l'environnement terrestre suivant des mécanismes physiques multiples
The sun interacts with the earth environment following many physical processes



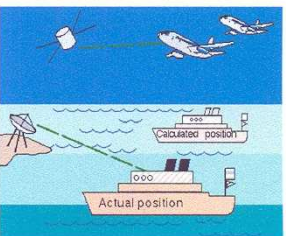
Changement d'orbite des satellites
Change of the satellite orbit



Courants électriques induits dans les pipelines
Induced electric currents in the pipelines



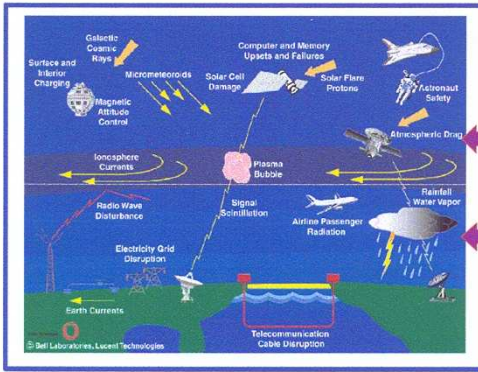
GPS GLOBAL POSITIONING SYSTEM



Navigation
Navigation

Recherche : Le signal émis par un satellite est modifié par les couches qui entourent la terre
Research: The signal emitted by a satellite is modified by the layers surrounding the earth

International Space Weather Initiative <http://www.iswi-secretariat.org>



COUCHES QUI MODIFIENT LE SIGNAL GPS
LAYERS WHICH MODIFY THE GPS SIGNAL

80-600 km IONOSPHERE

ionization par les radiations EUV / Ionization by EUV solar radiation
Contenu Total en Electron / Total Electron Content TEC

0-11 km TROPOSPHERE

Contenu intégré en vapeur d'eau / Total integrated water vapor

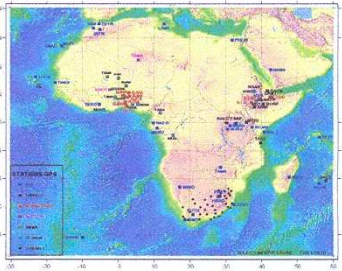
L'ANALYSE DES SIGNAUX GPS PERMET DE CONNAITRE CERTAINES PROPRIETES DES COUCHES TRAVERSEES
THE ANALYSIS OF THE GPS SIGNAL GIVES INFORMATION ON THE PROPERTIES OF THE CROSSED LAYERS

Training Team
Enseignants

- Amory-Mazaudier C.
- Bock O.
- Brou T.
- Cottrell L.
- Damé L.
- Fleury R.
- Lassudrie Duchesne P.
- Masson F.
- Petitdidier M.
- Zhizhin M.

Ecole de Météorologie de l'Espace
School on Space Weather
Université d'HELWAN

20 Septembre au 2 octobre, 2010, September 20 to October 2, 2010
Organisation : Ayman Mahrous et Christine Amory-Mazaudier



Réseau GPS pour la Recherche
GPS network for Research



UNIVERSITÉ D'ARTOIS



TELECOM BRETAGNE



Microsoft Research







NATIONAL ACCELERATOR LABORATORY



VIII. BUDGET

Tickets of French Professors	4430.55€	page	28
House cost (including diners)	7610€	page	29
Invoice Housing cost		page	30
Microsoft	5000€	page	31
Invoices		page	32

Total cost **17840.55€**

Tickets of French Professors

Name	Flights	Cost	Supported by
Amory-Mazaudier C. LPP/polytechnique/UPMC	AF 508 -> 16/09/2010 AF 503 -> 03/10/2010	525.76€	LPP
Bock O. LARENG/IGN	EgyptAir - MS 800 19/09/2010 EgyptAir - MS 803 26/10/2010	421.05€	DRI/CNRS
Brou T. Université d'Artois	EgyptAir - MS 800 19/09/2010 EgyptAir - MS 803 26/10/2010	421.05 €	DRI/CNRS
Dame L. LATMOS	EgyptAir MS0800 -> 19/09/2010 EgyptAir MS0803 -> 03/10/2010	441.05€	DRI/CNRS
Fleury R. Télécom Brest	AF 7363-AF 508 : 19/9/2010 AF 521-AF 7736 : 26/9/2010	711.13 €	DRI/CNRS
Lassudrie Duschesne P. Télécom Brest	AF 7363-AF 508 : 19/9/2010 AF 521-AF 7736 : 26/9/2010	711.13 €	DRI/CNRS
Masson F. IPG Strasbourg Université de Strasbourg	AF508 -> 19/09/2010 AF521 -> 26/09/2010	759.10€	DRI/CNRS
Petitdidier M. LATMOS	AF508 -> 23/09/2010 AF521-> 03/10/2010	438.28 €	DRI/CNRS
Total		4430.55€	

Total cost (Tickets) for all French professors is: 4430.55€

Housing cost (including diners)

Rooms' occupancy as reserved and used is:

N0 Room	Number of nights	Room rate	Total
Triple room n°3	17	62\$	1054\$
Room n°5 single	11	35\$	380\$
Room n° 7, 8, 9 and 10 double	15	50\$	3000\$
Room n°11 single	15	35\$	525\$
Room n°12 single	8	35\$	280\$
Total of price nights			5244\$
85 dinners X 5 \$			425\$
12% service			68.028\$
The total U.S. dollar			6349.28\$ ~ 4885 € (T = 1.3)

Number 700 and lunch x 25	17 500.
12% service	2100
Total price lunches	19 600
Reservation Great Hall	750
The second floor dining room	450
The fourth dining room	450
Total Egyptian pound	21 250

Total US dollar	3541.67\$ ~ 2725 €
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Total €	7610€
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Invoice Housing ~7610€



مطالبة عن إقامة ورشة عمل بعنوان
مدرسة صيفية لعلوم الفضاء في
الفترة من ٩/١٦ : ٣/١٠/٢٠١٠

م	رقم الغرفة	عدد الليالي	سعر الغرفة	الإجمالي
١	غرفة رقم ٣ (ثلاثي)	١٧	٦٢ دولار	١٠٥٤ دولار
٢	غرفة رقم ٥ (فردى)	١١	٣٥ دولار	٣٨٥ دولار
٣	غرفة رقم ٨، ٩، ١٠ (زوجي)	١٥	٥٠ دولار	٣٠٠٠ دولار
٤	غرفة رقم ١١ (فردى)	١٥	٣٥ دولار	٥٢٥ دولار
٥	غرفة رقم ١٢ (فردى)	٨	٣٥ دولار	٢٨٠ دولار
٦	إجمالي سعر عدد الليالي			٥٢٤٤ دولار
٧	عدد ٨٥ وجبة عشاء * ٥ دولار			٤٢٥ دولار
٨	١٢ % خدمة			٦٨٠,٢٨ دولار
٩	الإجمالي بالدولار			٦٣٤٩,٢٨ دولار

١٠	عدد ٧٠٠ وجبة غداء * ٢٥	١٧٥٠٠ جنية
١١	١٢ % خدمة	٢١٠٠ جنية
١٢	إجمالي سعر وجبات الغداء	١٩٦٠٠ جنية
١٣	قاعة أ.د/ حسن حسنى	٧٥٠ جنية
١٤	صالة الطعام بالدور الثاني	٤٥٠ جنية
١٥	صالة الطعام بالدور الرابع	٤٥٠ جنية
	الإجمالي بالجنية المصري (واحد وعشرون ألف ومائتان وخمسون جنيها)	٢١٢٥٠ جنية



MICROSOFT financial support

	cost
Posters Bags (50*15) Note books CD	1035€
Coffee etc...	630€
Books	1702€
2 tickets of Professors (USA and Russia)	1340€
Change and local transport	~293€
Total	5000 €

Invoices concerning the financial support of MICROSOFT
Coffee = 5000 livres ~ 630 €

عرض أسعار

تحريراً في: / / ٢٠٠
المطلوب من السيد/

البيانات	قناة	عدد	الإجمالي	
			جنيه	قرش
شاي تركية ومنتجاتها	٥٠	٥٠	٢٥٠٠	
بسكويت متنوعة	١٠	١٠٠	١٠٠٠	
باجية	٢	١٠٠	٢٠٠٠	
عصير	٢	٢٥٠	٥٠٠	
إجمالي			٥٠٠٠	
خط لا يمر في آلاف جنيه				

Books = 13524 livres ~ 1703 €

بمطابقة ضريبة رقم ٣٥١١
مباشرة ضرائب الجماعية
رقم الملف ١٨٩ / ١٦ / ٢٥٦
رقم التسجيل بضريبة المبيعات
١٠٠ / ٢٩٨ / ١١٧

S
قائمة مبيعات
(706112)

محسن القيسومي
للمصنعة والتجارة والاستيراد
اصلاح ماسم ادارة الشركات - الحسابية
٢٩٨١٢١٢١ : ٢٩٨٢٢٢٢٢ - ٢٩٨٢٢٢٢٢
١ شارع ماسم المكتب - المبنى - القاهرة
٢٥٨٩٩١٠٠ : ٢٥٩٠٢٢٢٢ - ٢٥٩٠١٨٨٠ : ٢٥٨٩٩١٠٠
فرع صلاح ماسم

التسليم : ٢٠١٠/٢/٠٨
القائمة باسم : مركز مراقبة ورصد الطقس الفضائي

Book name	Publisher	Pries
Space Weather, Environment and Societies, 2006, by Jean Lilensten and Jean Borred	Springer	700
The Earth's Ionosphere: Plasma Physics and Electrodynamics, M. C. Kelley,	Academic Press, 2009.	850
Terrestrial Environment: An Introduction to Geospace - the Science of the Terrestrial Upper Atmosphere, Ionosphere, and Magnetosphere	Cambridge Atmospheric and Space Science Series	430
tion, Meaning, and Use of Geomagnetic Indices (Geophysical Monograph) Pierre Noël Mayaud - 1980	American Geophysical Union	500
Ionospheric techniques and Phenomena, 1978 By A. G.raud & M. Petit	D. Reidel Pub. Co	1100
Introduction to Ionospheric Physics, 1969 H. Risbeth, O.K. Garriot	Academicpress	920
Ionospheric Radio, Kenneth Davies, The Institution of Engineering and Technology, Herts, 2008	Earlier addition	798
Radio Waves in the Ionosphere, K. G. Budden, Cambridge University Press, Cambridge, 1961.	Cambridge	542
Ionospheric Tomography, V. E. Kuritsyn and E. D. Tereshchenko, Springer, Berlin, 2003.	Springer	1100
ic Reconnection: MHD Theory and Applications Author: Eric Priest, Terry Forbes	Cambridge University Press	585
The Sun (Second Edition), 2004, by Michael Stix	Springer	741
Physics of the Solar Corona: An Introduction with Problems and Solutions, 2005	Springer Praxis	495
The Solar Corona (Second Edition, 2010 - first was in 1997), by Leon Golub and Jay M. Pasachoff	Cambridge University Press	427
Sun, Earth and Sky (Second Edition, 2006), by Kenneth R. Lang	Springer Science	840
Global Positioning System Signals, Measurements, and Performance (Second Edition, 2006) Author: Pratap Misra, Per Enge	Ganga-Jamuna Press	665
Ionospheric Tomography: physics of Earth and Space Environments V. Kuritsyn, E. Tereshchenko	Springer	1090
An Introduction to Space Weather Mark Moldwin	Cambridge University press 2008	370
IDL Programming Technique, second Edition David W. Fanning, Ph.D.	Fanning Software Consulting	450
Magnetosphere & Solar physics The Sun: The Cambridge Encyclopedia of the sun Kenneth R. Lang	Cambridge University Press	429
The planet observer's Handbook Fred W. Price	Cambridge University Press 1994	845
physics: Introductory Astronomy and Astrophysics, fourth edition, 1998 Michael Zeilik, Stephen A. Gregory	Zeilik, Gregory	1020
Physics and Chemistry of the Solar System, second edition John S. Lewis	Elsevier Academic Press 2004	476
Geomagnetic Field: Introduction to Geomagnetic Fields Wallace H. Campbell	Cambridge University Press	856

اجمالي مبلغ ستة عشر الفا وثمانه واثمان وعشرون فقط لا غير

محسن القيسومي
للمصنعة والتجارة والاستيراد
٢٥٦ / ١٦ / ١٨٩
مباشرة ضرائب الجماعية

IX PARTICIPANTS

There were 57 participants to the school

- 22 participants followed the whole training (2 weeks)
- 10 participants followed the training on GPS (1st week)
- 10 participants followed only the training on Solar & Heliospheric Physics (2nd week)
- 15 participants followed some lectures

Three students obtained financial support for PhD training in France.

Their names are underlined in yellow.

mohamed el-saied nedal abu-alainain	undergraduate second year
Ali Farid Ali	undergraduate second year
khaled ali-elden mohammed	undergraduate second year
Ahmed Nabil Ahmed	undergraduate fourth year physics
Ahmed Mohamed Abass	undergraduate third year space
Mohamed El-saed Motaoh	undergraduate third year space
nadia mohamed hassan aboaly	marsed Helwan
Yasmine Mostafa Hathoot	Space Weather Monitoring Center SWMC
Mona Fathy abd elhafeth	SWMC
Mariem Mohamed ahmed salama	SWMC
Aliaa Abd el nasser madboly afify	SWMC
Ayat Emam ragab esmail	SWMC
Walaa Mohamed mohamed	SWMC
Ebtesam Farid	SWMC
Shereen Farid Mohamed	SWMC
Reham Mohamed Mahmoud	SWMC
Asmaa Fawzy Ali Hassan	SWMC
Heba Salah ahmed	SWMC
Hager mohmed salah	second year physics department
Abd El-Rahman Mohamed Abd El-Monam	Cairo University
Mahmoud Mohamed Mohamed Faried	NARSS

Essam Ghamry	PhD SWMC
Alshaima Saad	Student Cairo University
Mahmoud Gomaa	Student Helwan University
Abdellman Mohmed Elazab	Student Helwan University
Sherif Abobak Mohamed Ahmed	Student Helwan University
Ahmed Salah	Engineer Trimble
Refida Saber Said	Student Helwan University
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