European DIgital upper Atmosphere Server

DIAS

| • Issue 9 | • January 2006 |

In this issue:

DIAS is a demonstration project co-funded by the eContent programme of the European Commission, of two years duration (2004 - 2006).

DIAS consortium members:

- National Observatory of Athens, Greece (Co-ordinator)
- University of Athens, Department of Telecommunication and Informatics, Greece
- Rutherford Appleton Laboratory, Council for the Central Laboratory of the Research Councils, UK
- National Institute of Geophysics and Volcanology, Italy
- Swedish Institute of Space Physics, Sweden
- Leibniz Institute of Atmospheric Physics, Germany
- Space Research Center, Polish Academy of Sciences, Poland
- Blustaff S.p.A., Italy

DIAS data contributors:

- Pruhonice Ionospheric Station Institute of Atmospheric Physics, Czech Republic
- Observatori de l'Ebre, Spain

NEWS

New Users' Web page on DIAS server

A new Users' Web page is now available from the DIAS home page under the menu item "DIAS Users' Network".

This new menu option, DIAS Users' Network in the DIAS Home page, provides access to a number of services for members of the DIAS Users' Network.

Registered members may:

- Send invitations to join the DIAS Users Network to interested parties.
- Use the Feedback Form to submit feedback on the DIAS Server Prototype.
- Use the Update Form to modify their replies to the DIAS questionnaire in case their personal details and/or preferences have changed.

In addition, the page contains a password reminder, whereby members may request and receive their DIAS server prototype credentials by email.

DIAS Web Demonstrator and DIAS server prototype

Two interfaces are currently available to evaluate DIAS services.

The WEB DEMONSTRATOR is available to **anyone** who would like to view a display of all the DIAS services in their final form. This Demo gives the opportunity to explore the DIAS products and services for a pre-selected period (from 5th to 14th of September 2005).

The SERVER PROTOTYPE offers, to **registered users**, online access to added-value products of real-time ionospheric data over Europe.

DIAS Training kit

The training kit for DIAS user includes a new release of DIAS brochure and the demonstration CD of DIAS products and services.
It is possible to receive the web demo CD asking for it at the address: dias@ingv.it.

TUTORIAL

Why bother with ionospheric prediction and forecasting?

The characteristics of an ionospheric propagation channel, whether it is HF or trans-ionospheric, are highly variable on timescales ranging from 11 years of a solar cycle to a few seconds. Even during its quietest periods, the Sun produces the electromagnetic radiation and the solar wind, which simultaneously affect a variety of geomagnetic and ionospheric phenomena. Hence day-to-day and hour-to-hour changes in the channel characteristics occurred. Long-term variations, such as that dictated by the solar cycle are effectively described by the long-term prediction programs which are now in use. Very rapid changes require a significant radio equipment designer's attention and skills to deal with them. In principle these can be handled by well trained radio operators in their management of channel frequencies. However, such prudent operators are becoming an increasing rarity. Accordingly, users of HF and trans-ionospheric radio systems need assistance with their seasonal frequency planning and day-to-day frequency management.

Some users apply real-time channel evaluation (RTCE) techniques in their system management. Of course, there is no short-term ionospheric forecasting that can compete with advanced RTCE technique for the fully adaptive radio system. However, ideal usage of the ionospheric propagation channel can not be achieved through RTCE alone because it provides information on existing conditions but not those which are likely to develop over the next few hours or days. Users without ionospheric prediction and forecast information may be badly affected when dramatic foF2 and MUF depressions, polar cap absorption (PCA) or shortwave fadeouts (SWF) cause a total or partial loss of communication. Therefore, in frequency planning and management procedures the ionospheric forecasts, specification in real-time and long-term prediction serve an important purpose.

DIAS HAS THE ANSWER

DIAS will improve the accuracy and value of ionospheric specification, prediction and forecasts over Europe because it is based on real-time data from European ionosonds available to users every 15 minutes in a format shown in Figure 1.

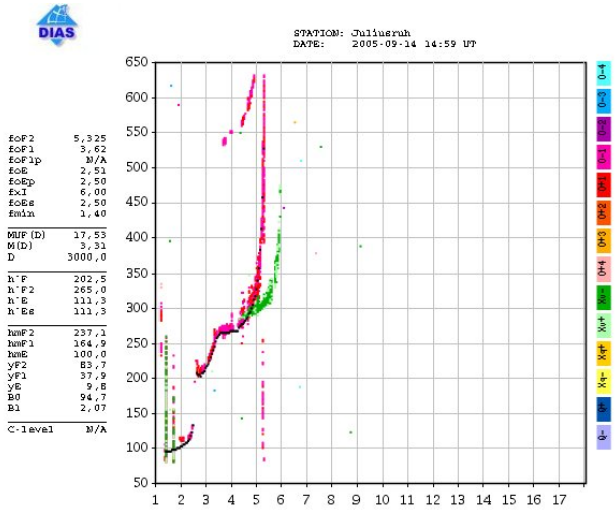

Figure 1. Ionogram from the ionospheric station Juliusruh on 14 September 2005 at 14:59 UT.

DIAS will improve the accuracy and value of ionospheric specification, prediction and forecasts over Europe because it is based on a regional scale modelling where it is possible to effectively predict months in advance the median ionospheric conditions with sufficient accuracy by using only the predicted sunspot number as required input parameter.

DIAS will provide new MUF, Short-term ionospheric forecasting and ionospheric activity index algorithms (Figure 2).

Overall DIAS will improve the accuracy and value of ionospheric specification, prediction and forecasts over Europe because it will issue real-time ionospheric information more frequently so that any users' predictions and forecasts based on an extrapolation of past conditions will be less prone to error. In practice it will operate by automation of data gathering and processing, and message distribution and fulfil there role in the European region as never before (Figure 3).

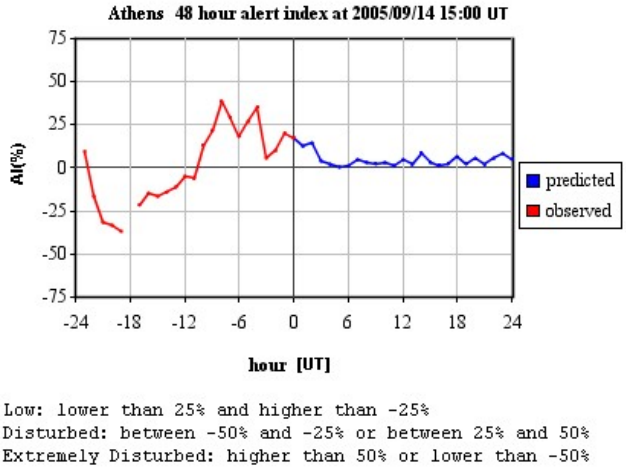

Figure 2. Ionospheric activity index at Athens ionospheric station issued on 14 September 2005 at 15:00UT.

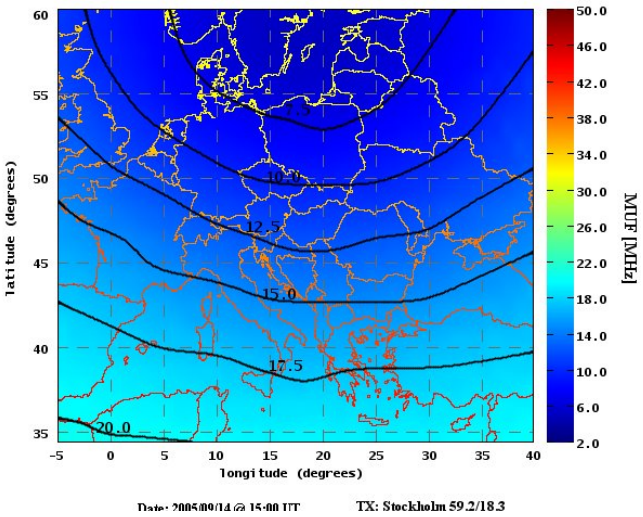

Figure 3. MUF map over Europe on 14 September 2005 at 1500 UT as seen from the transmitting point at Stockholm.

RELATED CONFERENCES

- Third CNES Workshop On Earth-Space Propagation
  Toulouse, France
  25 - 27 September 2006 ▪▪▪ New date!!! ▪▪▪
  http://www.cnes.fr/

- IEE Ionospheric Radio Systems and Techniques conference
  London, UK
  18 - 21 July 2006
  http://conferences.iee.org/IRST2006/

- SCOSTEP 11th Quadrennial Solar Terrestrial Physics Symposium
  "Sun, Space Physics and Climate"
  Hotel Gloria Convention Center
  Rio de Janeiro, Brazil
  6 - 10 March 2006
  https://salvador.secure-braslink.com/compassturismo.com.br/events/scostep/index.htm

- International School of Space Science: The Active Sun on your Active Desktop
  L'Aquila, Italy
  27 March - 1 April 2006
  http://62.173.166.248/isss/

- International Advanced School on Space Weather
  Abdus Salam International Center for Theoretical Physics
  Trieste, Italy
  2 - 19 May 2006
  http://cdsagenda5.ictp.trieste.it/full_display.php?ida=a05201

PRESENTATION OF DIAS RESULTS IN INTERNATIONAL MEETINGS

International Heliophysical Year European General Assembly
(Paris, France, 10 -13 January 2006)
"Ionospheric specification and forecasting methods based on observations from European ionosondes participating in DIAS project"
Belehaki, Lj. Cander, B. Zolesi, J. Bremer, C. Juren, I. Stanislawska, D. Dialetis and M. Hatzopoulos

3rd EGU Assembly (Vienna, Austria, 2 - 7 April 2006), session ST5.7 "Measurements of ionospheric parameters influencing radio systems"

"Ionospheric specification and forecasting based on observations from European ionosondes participating in DIAS project"
A. Belehaki, Lj. Cander, B. Zolesi, J. Bremer, C. Juren, I. Stanislawska, D. Dialetis and M. Hatzopoulos

PUBLISHED PAPERS ABOUT DIAS

"*DIAS Project: The establishment of a European digital upper atmosphere server*", Belehaki A., Cander Lj., Zolesi B., Bremer J., Juren C., Stanislawska I., Dialetis D., Hatzopoulos M., Journal of Atmospheric and Solar-Terrestrial Physics, Vol. 67, no. 12, pp. 1092-1099, 2005.

CALL FOR CONTRIBUTIONS TO DIAS NEWSLETTER

If you would like to submit a short contribution for the next issue of the DIAS newsletter, please contact the editorial office: DIAS@ingv.it.

The goal of DIAS is to develop a pan-European digital data collection on the state of the upper atmosphere, based on historical data collections and on real-time information provided by ionospheric stations belonging to Public European Research Institutes. DIAS services, such as radio propagation characteristics for the European region, ionospheric maps, alerts and warnings for ionospheric disturbances, etc., will be useful for large number of HF communication and navigation systems users and will contribute to the formation of a network of public research institutes and private sector users. For the effective exploitation of DIAS products and services a network of users will be established that will work together with DIAS data providers to bring out the full potential of this type of information.

Detailed information about the project can be found on DIAS home page (http://www.iono.noa.gr/DIAS/).

To change your e-mail address, to unsubscribe or to receive more information, please contact the editorial team: DIAS@ingv.it *or visit:* http://www.iono.noa.gr/DIAS/

This issue of the DIAS newsletter has been edited by Lucilla Alfonsi and Silvia Pau, INGV- Italy.
The Tutorial Section has been edited by Lj.R. Cander, RAL, CCLR - UK.
The "New Users' Web page on DIAS server" has been edited by Amalia Hatjievgeniadu, NOA - Greece