European DIgital upper Atmosphere Server

eContent

DIAS

| • Issue 7 | • November 2005 |

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

NEWS

The space weather event on September 2005.

A sunspot region made its appearance on the surface of the Sun on September 07, producing five strong (R3) radio blackouts, and one severe (R4) radio blackout (the fourth largest flare in the past fifteen years). Figure 1 shows one of the solar eruptions occurred in this period as observed by LASCO coronograph on board of SOHO spacecraft (Courtesy of SOHO, ESA & NASA). On early 11 September Dst reached about -130 nT (figure 2). When the Dst, a geomagnetic index which monitors the world wide magnetic storm level, assumes negative values indicates a magnetic storm in progress (for further details see the tutorial section).

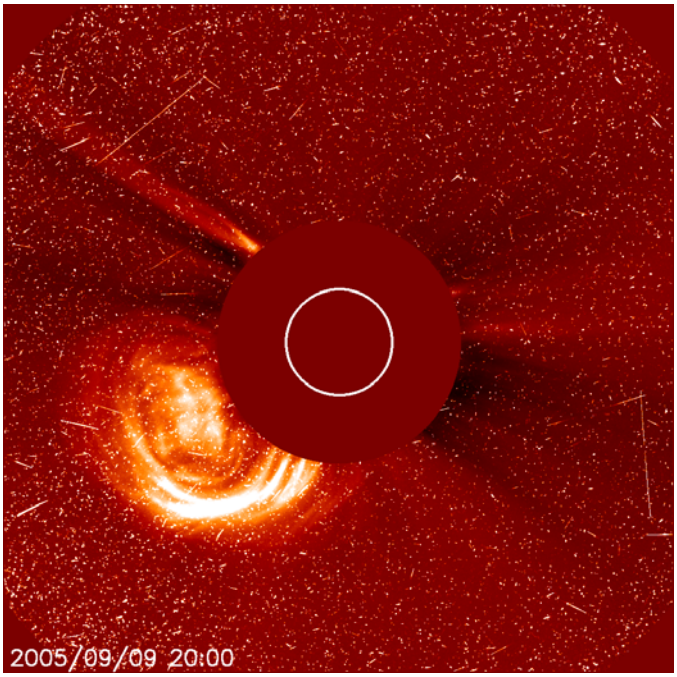


Figure 1

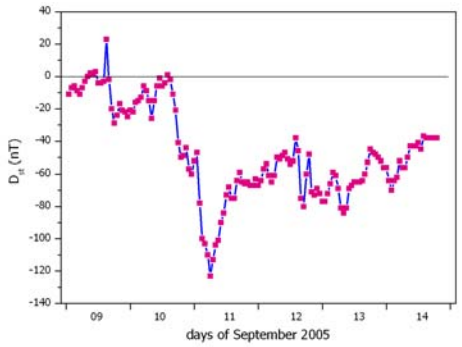
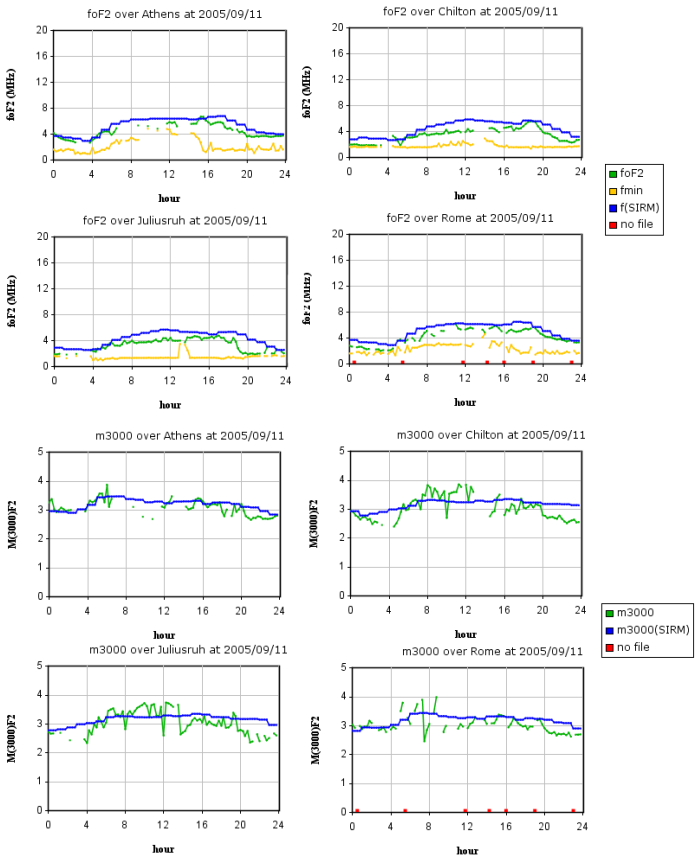
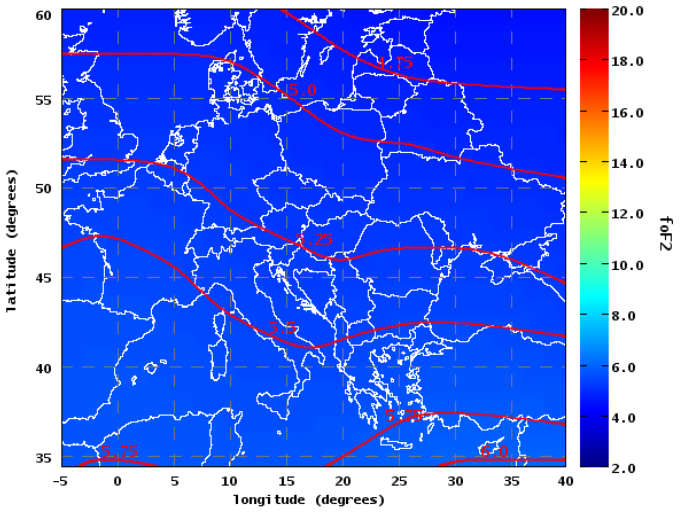


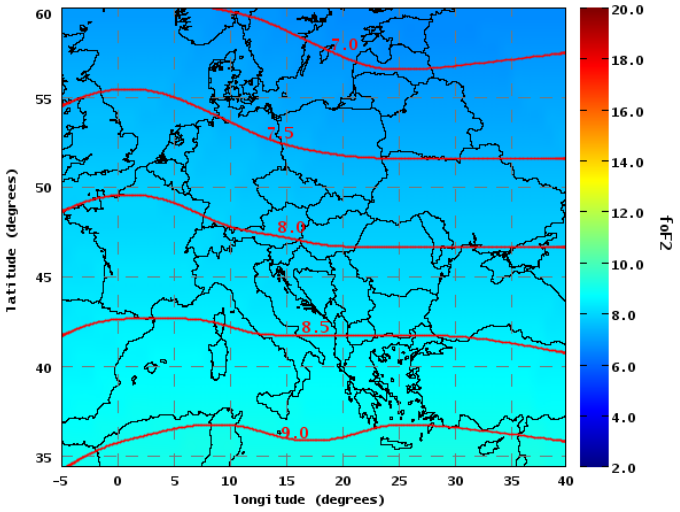
Figure 2

Under this type of helio-geophysical conditions the ionosphere is particularly variable in time and space and added value products, such as maps, plots and indices providing information on the upper atmosphere environment, can be very useful. As already shown in the DIAS prototype, the DIAS server will be able to offer this kind of service over the European area.
The figures below, extracted from the DIAS prototype, show an example of the foF2-plots and the M(3000)F2 plots produced along this storm period. This kind of service allows to recognise at first glance that in this period the ionosphere has been strongly disturbed, possibly compromising Spacecraft operations, HF communications, and navigation systems, such as GPS.



Looking at the F-plots, retrieved from the DIAS prototype, an ionospheric absorption is easily detectable around 12 UT as the lack of the green solid line indicating the foF2 and M(3000)F2 observed values. Another DIAS product, the foF2 nowcasting maps, here shown for 11 and 12 September at 12 UT, present an anomalous behaviour of F2 critical frequency recognisable in its high variability from one day to the next at the same hour (ranging between 5 and 9 MHz).





DIAS Prototype

The DIAS Prototype server is available on the web. All registered users will have free access until February 2006 and are welcome to contribute to the evaluation of the prototype server. Users' evaluation and general comments will be a valuable contribution to the development of the final DIAS server.
If you are not registered, and you would like to do so, please fill in the DIAS Questionnaire of products and services. When you have completed all four parts of

the questionnaire, you will receive the credentials for free access to the Server Prototype.

Aurora picture taken in Valkeakoski, Finland 10 September 2005

Training kit

A training kit for DIAS user has been produced. It includes a new release of DIAS brochure and the demonstration CD of DIAS products and services. The on line demo will be soon available through DIAS prototype.

FORTHCOMING DIAS MEETINGS

The organisation of a splinter session devoted to the DIAS project is scheduled during the 2nd European Space Weather Week (see Related Conference section for more details). The aim of the session is to demonstrate the project output to potential customers.

TUTORIAL

The Dst index

The Dst is constructed by averaging the horizontal component of the geomagnetic field from mid-latitude and equatorial magnetograms from all over the world. Negative Dst values indicate a magnetic storm is in progress, the more negative Dst is the more intense the magnetic storm. The negative deflections in the Dst index are caused by the storm time ring current which flows around the Earth from east to west in the equatorial plane. The ring current results from the differential gradient and curvature drifts of electrons and protons in the near Earth region and its strength is coupled to the solar wind conditions. Thus, by knowing the solar wind conditions and the form of the coupling function between solar wind and ring current, an estimate of the Dst index can be made.

RELATED CONFERENCES

- Second European Space Weather Week
  ESA-ESTEC, Noordwijk, The Netherlands
  14 - 18 November 2005
  http://esa-spaceweather.net/spweather/workshops/eswwII

- AGU Fall Meeting 2005
  Moscone Center West, 800 Howard Street
  San Francisco, CA, USA
  5 - 9 December 2005
  http://www.agu.org/meetings/fm05

- International Heliophysical Year European General Assembly
  Paris, FRANCE
  10 -13 January 2006
  http://calys.obspm.fr/IHY/IHY_colloque/

- ION NTM 2006
  Hyatt Regency Hotel, Monterey, California
  18 - 20 January 2006
  http://www.ion.org/meetings/

- Third CNES Workshop On Earth-Space Propagation
  Toulouse, France
  22 - 24 February 2006
  http://www.cnes.fr/

PRESENTATION OF DIAS RESULTS IN INTERNATIONAL MEETINGS

XXVIIIth URSI General Assembly
GP1 - General Poster Session Commission G
"*DIAS project: The operation of a digital server for nowcasting and forecasting ionospheric conditions over Europe.*"
B. Zolesi, A. Belehaki, Lj.R. Cander, J. Bremer, C. Jurén, I. Stanislawska, D. Dialetis, M. Hatzopoulos and the DIAS consortium members.

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.