Content

1. Hot News

- ***"Weather" reports*** are now available at the AFFECTS homepage – http://www.affects-fp7.eu/weather/
- UGOE has been invited to attend the ***3rd Annual World Summit on Infrastructure Security***, Westminster Palace, London, May 14-15, 2012 – http://www.eissummit.com/
- The ***AFFECTS review meeting*** will be held at REA, Brussels, May 16, 2012
- An AFFECTS **poster** is currently under development

2. News from the European Commission

- The International ***FP7 Space Information Day*** will take place from 20-21 June 2012 at the University of Surrey, United Kingdom – http://www.space-infoday.eu/
- The European Commission has published a paper called "**The 10 Most Recurrent Financial Errors in FP7**" with very helpful examples on how to avoid common financial errors. The presentation can be downloaded here: http://ec.europa.eu/research/fp7/pdf/avoiding-errors/error_free_cost_reporting_under_fp7.pdf#view=fit&pagemode=none

3. Status of Deliverables

Until December 31st the following deliverables were due and have been completed timely:

D1.1: Definition of internal document templates (Lead: UGOE, co-lead: DLR)
D1.2: Kick-off meeting documentation (Lead: UGOE, co-lead: DLR)
D1.3: Provision of online wiki-interface (Lead: UGOE, co-lead: DLR)
D1.4: Report on formation of Steering Committee, Advisory Board and URIT (Lead: UGOE, co-lead: DLR)
D2.1: Provision of a dedicated web-interface for EUV data (Lead: ROB, co-lead: FHG)

D2.4: Online provision of L1 solar wind, geomagnetic indices data base (Lead: UoT, co-lead: DLR)
D2.5: Provision of a web-interface for AE activity monitor and local indices database (Lead: UoT, co-lead: DLR)
D2.6: Online provision of GNSS based ionospheric data base (Lead: DLR, co-lead: UoT)
D3.2: Provision of layout for an early warning system for GNSS users (Lead: DLR, co-lead: SRI NASU-NSAU)
D5.1: System architecture document (Lead: DLR)

Upon revision by the REA the deliverable reports will be published on the AFFECTS website. The next deliverables will be due in August 2012.

4. Status of Work Packages

4.1 WP1: Management

The first AFFECTS General Meeting together with the 2nd Steering Committee Meeting have been organised in WP1. Additional to the preparation of the follow-up of the meetings, the 1st Periodic Report has been elaborated.

4.2 WP2: Data, Calibration, Maintenance and Instrumentation

An ionospheric data base has been added to the SWACI AFFECTS website (http://swaciweb.dlr.de/AFFECTS/). It contains GNSS based maps of Total Electron Content (TEC) for the European region and global maps (cf. Figure 1). A direct data download is possible for members of the AFFECTS consortium.

The ionospheric data base is provided for different processing modules of the Forecast System Ionosphere (FSI) which will be established in the AFFECTS WP5. Two examples for modules requiring this data base are the TEC perturbation forecast tool or the quality checks of the CTIPe.
Furthermore, local geomagnetic observations provided by University of Tromsø are visualized (an example is given in Figure 2) in order to monitor the propagation of geomagnetic disturbances in high latitudes. The provision to AFFECTS consortium members in near real time is prepared and will follow soon.

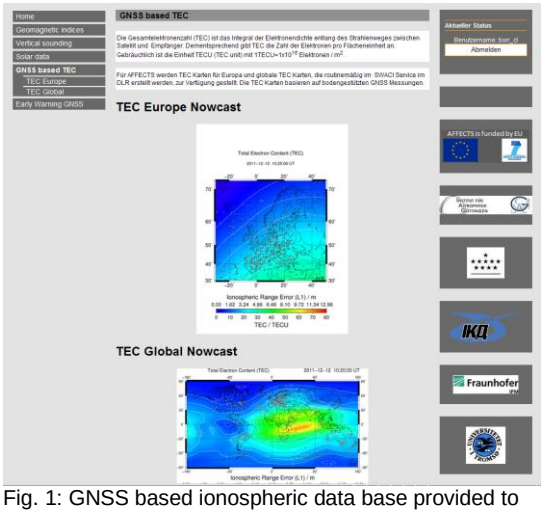

Fig. 1: GNSS based ionospheric data base provided to the AFFECTS consortium on the SWACI AFFECTS website (http://swaciweb.dlr.de/AFFECTS/)

4.3 WP3: Early Warning System

In this work package, eruptions on the Sun are monitored in order to provide an early warning whenever the Earth is expected to encounter space weather conditions within the hours and days to follow.

Recently, ROB has performed a study on how to use EUV (Extreme Ultra Violet) data from the Lyra radiometer onboard the Proba2 satellite as a proxy for the GOES X-ray flux, which is the reference instrument for flare monitoring. This is especially useful since GOES experiences data gaps from time to time. The resulting Lyra curve can be used to estimate the peak intensity of a bunch of flares with an accuracy of about 10%. Although this is not an

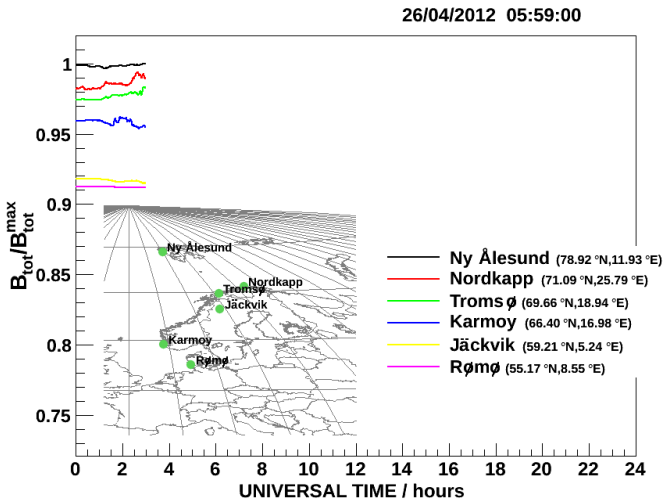

Fig. 2: Monitoring of geomagnetic activity. The measurements are delivered by University of Tromsø.

explicit AFFECTS deliverable in itself, the results of the Lyra study mentioned above will be used to develop an operational Lyra flare warning.

At the University of Göttingen, CME characteristics derived from stereoscopic modeling of data from the coronagraph COR2 onboard the STEREO-satellites were tested as input for the ENLIL CME simulation code, which predicts the solar wind speed and density at the Earth.

4.4 WP4: Forecasting Tools and Modelling

FHG and NOAA-SWPC are developing the unified database of solar EUVI measurements, which is necessary to counter the discrepancies between different sources. A preliminary version of the near-real-time auroral tracker is done by UoT. A preliminary version of software tool for forecasting geomagnetic indices was made by SRI and tested in near-real-time mode during the 7-10 March 2012 geomagnetic storm with satisfactory results. The TEC perturbation model describing the progress of ionospheric storms for the European region is being developed by DLR in collaboration with UGOE and UoT. Preliminary TEC analysis results show good agreement to the general characteristics of ionospheric storms described in literature.

4.5 WP5: Forecast System Ionosphere, User Interfaces

An ionospheric forecast system matching the needs of the users and implementing the objectives of the AFFECTS proposal will be developed in WP5. It aims to provide ionospheric predictions up to 24 hours in advance.

The system architecture document for the forecast system ionosphere (FSI), describing input, output and interfaces for all software modules being applied, has been finalized. An overview on the FSI architecture is given in Figure 3. The DLR will establish the system frame of the FSI in general according to the system architecture document. All AFFECTS consortium members contribute to the FSI either by data delivery or by developing processing modules.

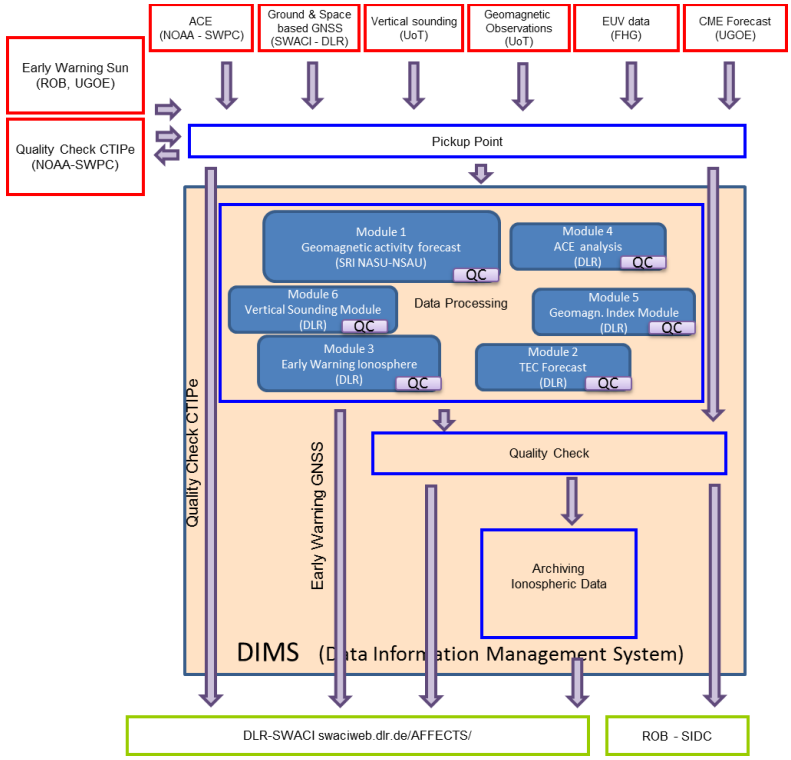

Fig. 3: Overview on the system architecture of the Forecast System Ionosphere (FSI).

4.6 WP6: Data and Product Dissemination, Product Sustainability

The over-riding function of WP6 is to provide overall space weather data and in particular early warnings and forecasts to end users, scientific community, and general public. Though this WP does not start before September 2012, a lot of work has already been done.

A new AFFECTS website with the special purpose of data dissemination has been established in the environment of the DLR SWACI web service (http://swaciweb.dlr.de/affects/). This website incorporates a solar, geomagnetic and ionospheric database. Additionally, it provides equivalent ionospheric slab thickness products. These are retrieved from vertical sounding data (UoT) and TEC (the Total Electron Content in a vertical pile of the ionosphere) data (DLR). The website provides public as well as confidential data sources. The access to the confidential data sources is restricted to the AFFECTS consortium that can logon to the website.

For the general public, "The Sun in 3D" has been delivered with a booklet on space weather, and the AFFECTS trailer is near completion (http://www.affects-fp7.eu/pr/movie/).
There has been AFFECTS media coverage (newspapers, radio, journals, TV) for solar storm events that have received public attention. Furthermore, AFFECTS provides official space weather warnings to RTL Media Group, and the SWACI TEC map can be consulted in the NASA Space Weather App (http://www.nasa.gov/centers/goddard/news/releases/2012/12-20.html).

In December 2012, the organisation of a user workshop is planned.

5. Featured Beneficiary

In each newsletter we will introduce one beneficiary, starting with the coordinator, the Georg-August-University Göttingen, and followed by ROB, SRI NASU-NSAU, FHG, UoT, DLR and ASTRIUM ST. The National Oceanic and Atmospheric Administration (NOAA in Boulder, USA) and the Planetarium Hamburg (Germany) as external collaborators will also have the opportunity to present themselves. This issue's featured beneficiary is the Space Research Institute in Ukraine (SRI NASU-NSAU).

5.1 Space Research Institute of the National Academy of Sciences of Ukraine and the National Space Agency of Ukraine

The Space Research Institute (SRI NASU & NSAU) is a leading Ukrainian research organisation specialising in different aspects of space research. Founded in 1996 on the basis of the Control Systems Division of the V. M. Glushkov Institute of Cybernetics of NASU, the Space Research Institute has many specialists in information theory and control theory. Due to this fact, the development of aerospace **automatic control systems** and **new methods of spacecraft data processing** as well as **space information systems and technologies** are among its main research areas. The developed algorithms are used in the latest Ukrainian spacecraft for attitude control. In the following years many specialists in space physics and plasma physics from other leading universities and research institutes have joined the staff. Thus, new research areas have emerged: **solar-terrestrial physics and space weather**, **microgravity science**, **remote sensing** applications and services, and the development of **advanced instrumentation** for space research. This made the Space Research Institute **the main space weather centre** in Ukraine and a **PI of all Ukrainian space weather related missions**, commenced (Sich-1M/Variant), ongoing (Sich-2/Potential) and planned (Ionosat-M, Ionosat-S). All Ukrainian astronauts are employed by the Space Research Institute for the whole duration of their preparation and spaceflight.

Apart from the main facility in Kyiv, the Space Research Institute also has two regional centres. The L'viv Centre, also founded in 1996 on the basis of the Special Design Office of the G. V. Karpenko Institute of Physical Mechanics of NASU, specialises in the development and manufacture of **scientific payload** as well as instruments for ground-based measurements. The excellent quality and reliability of these instruments were marked by the Christian Huygens medal in 2009. These instruments are **spaceflight-proven** in many Ukrainian, Russian and European spacecraft. The L'viv Centre also performed a series of **active space experiments** using their self-developed acoustic sounder, in particular with simultaneous measurements on the French DEMETER spacecraft. The Kharkiv Centre, founded in 2008 jointly with the Kharkiv National University of Radio Electronics, deals with the **ground support of Earth observations from space**.

The Space Research Institute is involved not only in research, but in other activities as well. It utilises its broad network of national and international partners to **coordinate and promote Ukrainian space research activities worldwide**. It represents Ukraine in several major international organisations such as COSPAR, IFAC, IAF, CEOS, WGISS, GEO, ISECG, and ILWS. It also hosts the **UN-SPIDER Ukraine Regional Support Office**.

Another type of activities is education and public outreach. The staff members of the Space Research Institute teach the students in the best Ukrainian universities. The best **students are employed** to complement the theoretical knowledge gained in the lecture halls with practical hands-on research experience under the supervision of seasoned professionals. Most of these students after the graduation enter the **post-graduate school** of the Space Research Institute. The PhDs have the possibility to enter the **post-doctoral courses** to receive a D.Sc. degree in physical or technical sciences. Additionally, the Space Research Institute cooperates with the mass media to improve the public awareness of space activities with space weather being the most frequently addressed topic.

Fig. 4: Top row, from left to right: Dr. Oleg Semeniv, Prof. Oleg Cheremnykh, Prof. Vsevolod Kuntsevich, Dr. Aleksei Parnowski, Dr. Igor Kremenetsky
Bottom row, from left to right: Dr. Nikolai Salnikov, Ms. Anna Polonska, Prof. Vitaliy Yatsenko

In the AFFECTS project the Space Research Institute is represented by a team of specialists in different research areas ranging from information theory to space plasma physics. The main goal of the group is the development of the operational geomagnetic activity forecast module.

6. Press & Media

- See AFFECTS website for updates
- The latest version of the AFFECTS video trailer is available at the following link: http://www.astro.physik.uni-goettingen.de/~bothmer/AFFECTS/.

7. Collaborations

- Collaboration with **infoNetwork GmbH** documented through official letter of agreement. In this context a prototype space weather report is in progress.
- Collaborations with other EU projects, such as HELIO and COMESEP are progressing.
- Collaboration with **D. Odstrcil at NASA/GSFC** is established to develop CME modelling within **ENLIL code**.

8. Announcements and Upcoming Events

- *May 14-17, 2012:* Extreme Space Weather Events Workshop, in Boulder, CO, USA.
- *June 5-7*: 5th Gossamer ESA/DLR Solar Sail Working Group Meeting and Workshop, ESTEC, Noordwijk, Netherlands
- *June 17-22*: Solar Wind 13, Big Island, Hawaii, USA
- *July 14-22*: 39th COSPAR Scientific Assembly in Mysore, India
- September 10-14, 2012 5th Solar Orbiter Workshop, in Bruges, Belgium.
- October 22-24, 2012 Space Weather and Challenges for Modern Society in Oslo, Norway.
- *November 5-9*: 9th European Space Weather Week in Brussels, Belgium
- November: **3rd AFFECTS Steering Committee Meeting** in Brussels, Belgium (during ESWW9)
- Specific meetings of potential interest:
    - *May 21-23*: Coronal Magnetism – Connecting Models to Data and the Corona to the Earth, in Boulder, CO, USA
    - *May 31 - June 7*: Heliophysics Summer School, in Boulder, CO
    - *June 4-9*: 1st European School on “Fundamental Processes in Space Weather: A Challenge in Numerical Modeling”, in Spineto, Italy
    - *July 1-6*: European Week of Astronomy and Space Science, in Rome, Italy.
      * The Sun: New tools and ideas in observational Solar Astrophysics
      * From solar physics to astrophysics: the Sun as Rosetta stone for understanding astrophysical processes

For more meetings see http://sohowww.nascom.nasa.gov/community/