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SAVE THE DATE: A dedicated AFFECTS GM for coordination of project efforts in year 3 will be held at Göttingen or Freiburg on September 24-25, 2013.

1. Summary of International User Workshop

On February 28 the AFFECTS team welcomed 45 participants to its first international User Workshop at the ROB in Brussels. There were participants from Belgium, France, Germany, Luxemburg, Norway, Spain, The Netherlands, Ukraine and the United States.

Various AFFECTS products and services were presented to the users, by means of talks, posters and demos, filling the whole range of solar detections and alerts, CME modeling and arrival forecast, geomagnetic and



Fig. 1: AFFECTS team and User WS participants during the AFFECTS User WS.

ionospheric forecasts, as well as monitoring of auroral electrojets boundaries.

Both in personal contacts and as outcome of the user questionnaire, users indicated their enthusiasm about the AFFECTS User Workshop and the presented AFFECTS products and services.



All presentations and further material can be downloaded from the AFFECTS website at <http://www.affects-fp7.eu/news-events/user-ws/>.

2. Status of Deliverables

The deliverable reports from the **first project year** can be found at <http://www.affects-fp7.eu/project/deliverables/>.

Project year 2 (March 2012 – February 2013) comprised of the following nine deliverables:

- D3.3: Provision of final version of Early Warning System (Lead: ROB)
- D4.1: Provision of software tool for forecasting indices (Lead: SRI NASU-NSAU)
- D4.2: Report on solar EUV characteristics (Lead: FHG)
- D4.3: Online provision of auroral alert and tracking system (Lead: UoT)
- D4.4: Provision of software tool for forecasting perturbed TEC (Lead: DLR)
- D2.2: Online provision of solar activity proxies and solar activity data base (Lead: ROB)
- D2.7: Analytical Model for SEPS sensor (Lead: ASTRIUM)
- D3.4: Report on quality control and user feedback (Lead: ROB)
- D6.2: International user workshop documentation (Lead: ROB)

All deliverables have been submitted via the Participant Portal and are currently under review. Upon their approval they'll be published on the AFFECTS website.

In **project year 3** (March 2013 – February 2014) the following 10 deliverables have to be completed:

- D5.2: Report on product generation test (Lead: DLR)
- D5.3: Report on quality control checks (Lead: DLR)
- D6.3: Report on User Workshop results (Lead: ROB)
- D5.4: Report on overall functionality test (Lead: DLR)
- D5.5: Establishment of continuous online operation system at DLR/SWACI (Lead: DLR)
- D6.1: Establishment of continuous online operation system at ROB/RWC (Lead: ROB)
- D3.1: Provision of online operational integration of software packages in full operational chain (Lead: ROB)
- D6.4: Report on long-term product sustainability (Lead: ROB)
- D6.5: Space Weather Multimedia Show (Lead: UGOE)
- D6.6: AFFECTS Space Weather Mobile Phone App (Lead: UGOE)
- D3.2: Online provision of SEPS EUV and plasma data (Lead: FHG)

3. Status of Work Packages

3.1 WP2: Data, Calibration, Maintenance and Instrumentation

WP2 work is up to date, and the data flow within the AFFECTS system is flawlessly running, feeding the generation of the project space weather products and services. The one remaining deliverable is on the SEPS instrument, its development is also proceeding according to schedule. For the further investigation of an empirical model for the



reconstruction of EUV fluxes measured with the SEPS sensor a vacuum chamber with a VUV light source has been reactivated. By changing the plasma gas different EUV spectra can be generated. First measurements with Nitrogen were successful. Next steps include the combination of the SEPS sensor with a monochromator for the selection of distinct wavelengths as well as the measurement with different plasma gases like Helium, Argon or Xenon. On going optimization of lamp parameters are performed. A SEPS simulation report was published by Wilfried Pfeffer from EADS Astrium describing an analytical model for the plasma and RPA mode of the sensor. Activities have also started to look for correlations between plasma data provided by DMSP SSIES satellites and onset events defined by DLR Neustrelitz. However, SEPS has not gained a flight opportunity.

3.2 WP3: Early Warning System

Solar Demon, the near real time dimming and EIT wave detector providing quicklook SDO-AIA data, has developed its eruption detection core into a stand-alone flare detector. Both Solar Demon and its flare detection spin-off will provide web-based output as an event catalog for AFFECTS, and will provide dedicated parameters for the pipeline of the FP7 COMESEP project, both updated in near real time.

Full details on the forecast verification of both ROB's predicted F10.7 flux and predicted K Dourbes index were provided in Deliverable D3.4 ("Report on Quality Control and User Feedback"), alongside a quality control report about the space weather predictions produced by NOAA-SWPC. ROB is currently adding the prediction of flaring probabilities by its Regional Warning Center to its analysis on space weather forecast verification issues.

3.3 WP4: Forecasting Tools and Modelling

After the submission of all deliverables, the main activities in WP4 are:

- Support of other WPs, mainly WP5,
- Generation of patches for maintaining services with identified problem areas (e.g. concerning the data cleanliness from the ACE spacecraft at times of SEPs),
- Testing and improvement of existing products, and
- Sustainability procurement.

The following products were developed so far in WP4:

- Perturbed TEC forecast tool
- Geomagnetic forecast tool
- Auroral tracker

In addition, the AFFECTS project provided an excellent opportunity to share existing tools and services between the partners, significantly improving the effectiveness of the consortium. The most vivid examples are the CAT tool and the Enlil model, developed by NOAA-SWPC and NASA-GSFC respectively, which were granted to UGOE for research and to ROB for operational use.

Last but not least, NOAA-SWPC has agreed to run the products developed within AFFECTS side-by-side with their existing services of similar nature to assess their quality and provide independent validation.



3.4 WP5: Forecast System Ionosphere, User Interfaces

Currently the test phase of the early warning message for GNSS users, which is recently sent automatically to a few external test users only, is in progress. We will implement useful suggestions and comments by the users during the next weeks and plan to open the registration for this service to the public at the end of June. We are now in the process of finalizing the report on the product generation test (Deliverable 5.2) of the Forecast System Ionosphere (FSI). During the product generation test we found inconsistencies in the interaction of the combined modules within the FSI system, which we had to fix to ensure the reliability and maintenance of the system. We have also decided to include some information on the quality of the generated product in the FSI metadata xml-file. The output of the respective modules had to be adjusted accordingly. The changes will be important for the planned quality control checks, which will be described in detail in the upcoming Deliverable 5.3. We are pleased to report that Claudia Borries will be back from maternity leave in June and will strengthen the AFFECTS working group at DLR.

3.5 WP6: Data and Product Dissemination, Product Sustainability

The AFFECTS User Workshop, which took place on February 28, was a great success. User feedback, based on questionnaires, was compiled in Deliverable D3.4 ("Report on Quality Control and User Feedback"). A detailed documentation of all AFFECTS products and services presented at the User Workshop was summarised in Deliverable D6.2 ("International user workshop documentation").

The AFFECTS Forecast System Ionosphere has been presented in a talk at the NOAA Space Weather Prediction Center (SWPC) in Boulder, CA, USA on the 12th of April ahead of the international space weather week. The TEC Forecast and the Early Warning for GNSS users have been especially emphasized and discussed in detail during this occasion. Furthermore, an AFFECTS poster on the "Forecast of Total Electron Content over Europe for disturbed ionospheric conditions" has been presented at the 13th Space Weather Week in Boulder/Colorado (USA) during the poster session "Ionospheric/Thermosphere Research and Applications" on 18th of April.

On the 30th of April the Forecast System Ionosphere of the AFFECTS project has been highlighted in a presentation at the 4th expert meeting of the German Space Situational Awareness Center.



4. Featured Beneficiary

Each newsletter will introduce one AFFECTS project partner, starting with the coordinator, the Institute for Astrophysics of the Georg-August-University Göttingen, and followed by ROB, SRI NASU-NSAU, FHG, UoT, DLR and ASTRUM ST, including the National Oceanic and Atmospheric Administration (NOAA in Boulder, USA) and the Planetarium Hamburg (Germany) as external collaborators. This issue features the NOAA-SWPC.

4.1 NOAA Space Weather Prediction Center, Boulder, CA, USA

The NOAA Space Weather Prediction Center (NOAA-SWPC) includes an operational Forecast Center that operates 24 hours a day/7 days a week and provides space weather alerts, watches, and warnings to tens of thousands of commercial customers and international agencies. The Center is the lead of the 14-Nation International Space Environment Services organization. One of the fastest growing segments of the customer base depends on GPS/GNSS systems for daily commercial operations. The GPS/GNSS customers have very clearly requested improved specification and forecast products to improve their efficiency and reliability in the market place. In some cases, such as commercial air transportation, there is a risk to life and property during major space weather storms. For this reason, the ionospheric products developed within the AFFECTS project will have great benefit to the customers and users of GPS/GNSS systems. The SWACI model of the ionosphere is currently undergoing test and evaluation at the NOAA-SWPC. Forecasting GPS/GNSS conditions has proven to be quite difficult. Any forecast product from AFFECTS will have great benefit to space weather customers worldwide.

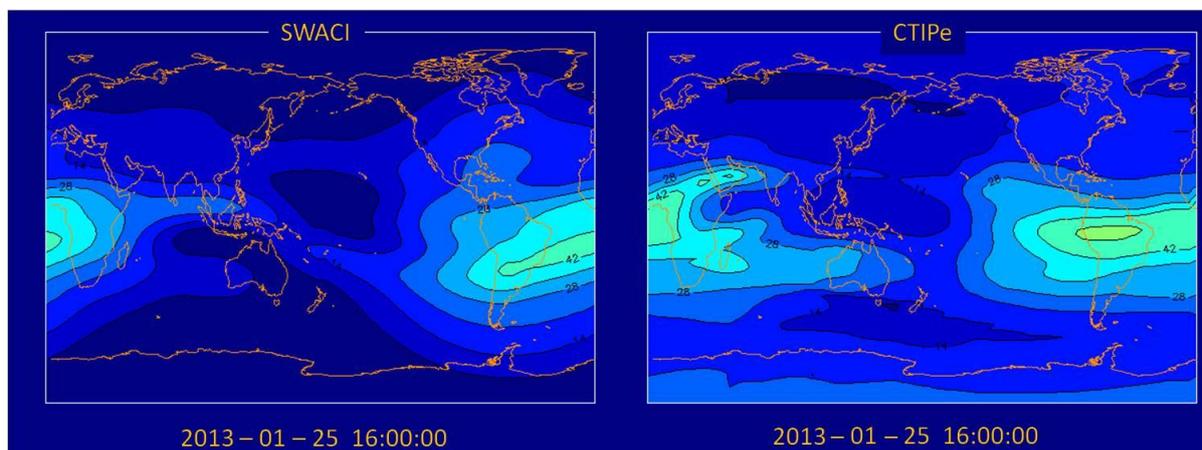


Fig. 2: Validation of the SWACI product for Total Electron Content (TEC) is done by comparing with the Coupled Thermosphere Ionosphere Plasmasphere with electrodynamics (CTIPe) model.



5. Press & Media

The latest project news is provided through the AFFECTS website. Solar activity was relatively weak so that the press releases on solar storms were rare after mid 2012. On May 21st a team from the German television station *Bayerischer Rundfunk* visited University of Göttingen's Institute for Astrophysics. On this occasion a prototype center for space weather forecast was set up. The working group of Dr. Bothmer will be featured at *Faszination Wissen* on BR on July 14th at 10 p.m.



Fig. 3: Producing Faszination Wissen at the Institute of Astrophysics in Göttingen.

(<http://www.br.de/fernsehen/bayerisches-fernsehen/sendungen/faszination-wissen/index.html>).

6. Collaborations

AFFECTS is actively collaborating with several other EU FP7 projects, such as eHeroes, HELIO and COMESEP. Media collaboration with **infoNetwork GmbH** has been officially declared through a letter of agreement. Collaboration with Dusan Odstrcil at **NASA/GSFC** has been established to develop CME modelling input for the **ENLIL** code. Dr. Odstrcil visited the Institute for Astrophysics in Göttingen in January and also participated in the 2nd General Meeting and User Workshop in Brussels in February 2013. Further collaborations are ongoing with ESA DLR Solar Sail WG, SSA activities, SPP and the Planetarium Hamburg show "Flammender Himmel" featuring AFFECTS.

7. Upcoming Events

June 24-29: 2013 ILWS Workshop on Space Weather Research with Space and Ground-based Observations at Irkutsk, Russia. The workshop will be hosted by the Institute of Solar-Terrestrial Physics of the Russian Academy of Sciences (<http://en.iszf.irk.ru/>). It is open to the international space weather research community. Additional information about the workshop will be available at the workshop web site: http://en.iszf.irk.ru/ILWS_2013.

June 24-28: AOGS 10th Annual Meeting, Brisbane Convention & Exhibition Centre, Australia, <http://www.asiaoceania.org/aogs2013/public.asp?page=home.htm> (Convener V. Bothmer)



July 8-12: 2013 Beacon Satellite Symposium, Bath, UK,
<http://people.bath.ac.uk/ee3jarr/beaconsatellite2013/>

July 16-25: Summer School Alpbach 2013, Space Weather: Science, Missions and Systems, <http://www.summerschoolalpbach.at> (invited participation of V. Bothmer)

September 2-6: 13th Ukrainian Conference on Space Research, National Space Center, Yevpatoria, Ukraine, Space research in general, has a dedicated section on Solar-terrestrial physics and Space weather, registration deadline: 17 June 2013, <http://space-conf.ikd.kiev.ua>

September 2-6: COSPAR Symposium "Cosmic magnetic fields: legacy of A.B. Severny", Crimean Astrophysical Observatory, Nauchny, Ukraine; Solar, stellar, and galactic magnetic phenomena (observations and theory), registration deadline: 01 June 2013, <http://solar.crao.crimea.ua/symp2013>

September 16-20: Second UK-Ukraine meeting on solar physics and space science, Kyiv, Ukraine; Solar-terrestrial physics (Space weather presentations are also welcome), registration deadline: 15 June 2013,
http://swat.group.shef.ac.uk/Conferences/Ukraine_UK_2013

September 24-25: AFFECTS third year 1st PM, Freiburg or Göttingen

October 3: EU Space Weather Projects Meeting, Brussels

November 18-22: 10th European Space Weather Week, Antwerpen,
<http://www.stce.be/esww10/>

For further meetings see <http://sohowww.nascom.nasa.gov/community/>

All previous newsletters can be downloaded from the AFFECTS website at <http://www.affects-fp7.eu/news-events/>.