

# **SPACE WEATHER WORKING TEAM**

## **Meeting # 15**

**Ministère de la Recherche, Paris, 19<sup>th</sup> July 2004**  
**COSPAR, Paris, 21<sup>st</sup> July 2004**

### **A. SWWT meeting / 19<sup>th</sup> July 2004**

1. Review of Actions
2. Cosmic Vision
3. Programmatic issues
4. SW ESA actions
5. Proposals to FP6
6. Review of E-STAR/COST/SWWT meetings
- 7 DIAS – Digital Upper Atmosphere Server
- 8 Topical group reports
- 9 AOB

### **B. SWWT meeting continuation/programmatic session 21<sup>st</sup> July 21 2004**

1. Clarification about the topical groups
2. Does the SW perimeter need to be modified?

### **C Summary of the actions**

<b>A - SWWT meeting - 19<sup>th</sup> July 2004</b>
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**Present**

E. Amata, IFSI/CNR  
 M. Balikhin, Univ. Sheffield  
 D.H. Boteler, ISES  
 I. Bates, Univ. Sheffield  
 A. Belehaki, NOA  
 A. Blusson, CLS  
 M. Candidi, IFSI/CNR  
 E. Clarke, BGS  
 S. Clucas, QinetiQ  
 N. Crosby, BIRA  
 E. Daly, ESA  
 E. Flueckiger, Univ. Bern  
 R. Gendrin, retired  
 P. Gille, LPCE/CNRS  
 A. Glover, ESA-ESTEC  
 D. Heynderickx, BIRA  
 N. Jakowski, DLR  
 J. Jansen, Univ. Greifswald  
 A. Hilgers, ESA-ESTEC  
 W. Kofman, LPG/CNRS  
 C. Lathuillre, LPG/CNRS  
 F. Lefeuvre, LPCE/CNRS  
 R. Leitinger, Univ Graz  
 J. Liliensten, LPG/CNRS  
 H. Lundstedt, Sweedish Institute f Physics  
 C. de Matos, ESA HG  
 M. Menvielle, CETP/CNRS  
 A. Mokay, BGS  
 R. Pirjola, FMI  
 J.Y. Prado, CNES  
 A. Pulkinen, NASA/GSFC  
 W. Riedler, IWF Graz  
 H. Rothkaehl, SRC PAS  
 S. Stankov, DLR  
 I. Stanislawska, SRC PAS  
 P. Stauning, DMI  
 A. Thomson, BGS  
 R. Van der Linden, Roy Obs. Belgium /SIDC  
 S. Walker, Univ. Sheffield  
 J. Watermann, DMI

**Apologies**

L. Cander, RAL  
 R. Ecoffet, CNES  
 M. Hapgood, RAL  
 W. Keil, EADS  
 B. Sanahuja, Univ. Bercelona  
 W. Vershuren, Belgium ESA Del

## 1. REVIEW OF ACTIONS

**Action 1** - To explore the possibility of including SW activities in GALILEO thematics (Bertram Arbesser-Ratsburg)

No reply was received

**Action 2** - To contact with the Galileo Joint Undertaking (GJU) (Bertram Arbesser-Ratsburg)

No reply was received

**Action 3** - To explore the possibility of submitting a proposal to FP6 thematic other than Aeronautics & Space.

The action has been completed. P. Gille reviewed open EU calls with space weather relevance (see P.Gille report)

- NEST INSIGHT appears to be the most useful FP6 opportunity. There are 2 open calls per year. INSIGHT can address risk issues. One of the main condition is that the proposed topic does not fall into the responsibility domains of another European entity (e.g. ESA) or of one of the EU priority thematic. In that respect GIC should be a good subject.
- It was felt that Galileo has a low probability of a good outcome.
- Aero & space calls tended to address Aero issues.
- GMES has its 3<sup>rd</sup> call next year. It was reported that this would be the last call and there maybe a greater chance of funding. The main topic addressed is security.

It was stated that discussion already begun concerning FP7. This will take place between 2007 and 2011. The transition should be smoother than when FP6 was introduced. The FP6 instruments will be maintained and improved in FP7. Space and security are new disciplines that will be introduced.

It was highlighted that now would be an appropriate time to introduce space weather concerns into the work programme. An action was taken to urge SWWT members to take part into the preparation of the space and security parts of the FP7 programme or at least to contact their national representatives to include space weather in those parts (**Action 1**). The action has to be engaged in September 2004.

Several comments were made about space weather and global change. Probably because it is associated with solar events, space weather is not considered as an element of global change. But, as suggested by M. Candidi, one could wonder whether space weather should also encompass long term phenomena. This point must be investigated, at least for FP7. Preparatory studies conducted in the context of E-STAR (solar variability and climate), COST 724 (space weather) and ESA programmes could be performed right now. Actions were taken:

- to set up a sub-group in charge of exploring space weather and long term phenomena (F. Lefeuvre, M. Candidi, J. Liliensten), other volunteers must contact F. Lefeuvre before 15<sup>th</sup> of September (**Action 2**)

- after first exchanges between sub-group members, to contact Commission officers in Bruxelles to see how proposals on long term phenomena could enter into global change (F. Lefeuvre, **Action 3**).

According to J. Lilensten, M. Fuellekrug suggested that E-STAR be the European contribution to thematic 2 of CAWSES (Climate Weather of the Sun-Earth System).

**Action 4** – To contact the national representatives in the European ILWS committee to ensure that the work carried out during the ESA funded parallel space weather studies is not duplicated in the initial phase of ILWS (all SWWT Members)

No information received on contacts of SWWT members with national representatives..

**Action 5** - To collect and to circulate all information on ongoing outreach activities (N. Crosby, F. Jansen)

See topical group reports.

**Actions 6 and 7-** To send to F. Jansen all information on the effects of the October solar events (all SWWT members), to collect and circulate all information on the effects of the October solar events (F. Jansen)

A list of effects has been compiled for the Halloween storms. Action is closed. In addition, there is a list of effects compiled by SEC at Boulder. This should be compared with the SWWT events to form a consolidated list. An approach to copy from SEC (go to <http://www.sec.noaa.gov/AboutSEC/>, scroll down to the last item under the heading, Programs and Plans. Look for *Release of Service Assessment - Intense Space Weather Storms*) is to collect and publish mails sent by users to point out services they used during solar storms (**Action 4**). By error, the list of volunteers was not copied. Those who are in this case must contact F. Jansen.

**Action 8** - To consider the possibility of extending next year's space weather workshop to a European SW week (A. Glover)

Actions have been taken with E-STAR and COST (see point 6 in the Agenda). The first European Space Weather week will take place at ESTEC from 29<sup>th</sup> November to 3<sup>d</sup> December 2004. The programme will be distributed soon.

**Action 9** - To send an expression of interest to Risto Pirjola and Hanna Lappalainen by 30<sup>th</sup> November 2003

(groups interested to contribute to the STREP proposal led by FMI).

Action closed

**Action 10** - To select partners and sub-contractors in the SW-RISK SREP proposal by December 15 (SWP-core group)

Action closed

**Action 11** - To send to Alexi Glover a one page report defining the topical group objectives and the minutes of any meetings (topical groups spoke persons)

See point 8 in the agenda.

## 2. COSMIC VISION

A SW proposal has been submitted to the ESA call for themes for Cosmic Vision 2015-2025 . It has been attached to the message announcing the SWWT meeting. A workshop on Cosmic Vision which will be held at UNESCO, 125 Avenue de Suffren, 75007 Paris, Salle IV, on 15 and 16 September 2004. A preliminary programme is available at:

<http://sci.esa.int/science-e/www/object/index.cfm?fobjectid=35668> (\*).

For security reasons, registration is mandatory to access the UNESCO premises. If you have not yet registered, you are kindly invited to do so electronically at:

<http://sci.esa.int/science-e/www/object/index.cfm?fobjectid=35584> (\*)

by 10<sup>th</sup> September at the latest

## 3. PROGRAMMATIC ISSUES

### Context

A letter to the members of the programmatic topical group was sent by F. Lefeuvre on February 14 2004. Inputs were solicited for : (i) inclusion of SW activities in the EU programme (GALILEO, GMES, etc.), (ii) alternative sources of funding to the ESA GSP programme, (iii) entry points to other European entities. Very few reactions were received. However, several important points were raised like the need of a SW steering Board committee (or executive committee), and the interest of the submission of a (modest) SW programme at the next ESA ministerial council.

The situation made to SW is progressively changing:

- The NOAA/SEC service integrated the National Center for environmental Prediction (NCEP). It depends now on the US weather service at the same level as the aviation weather center, the climate prediction center, the hydrometeorological prediction center, etc.
- In the EU white paper about Space, new topics are considered : (i) defence (crisis management, dual use of space equipments, survey of the Earth electromagnetic environment), (ii) capacity to provide information on solar eruptions, near Earth objects, debris), (iii) exploration of the solar system
- National committees recommend: (i) to give more weight to ESF recommendations about science, (iii) to have all operational activities under the EU responsibility.

### Decisions and/or actions

After discussions, the following decisions and/or actions were taken.

- (a) The SW steering Board Committee (or executive Committee) and the submission of a SW programme are discussed in point 4 of the Agenda.
- (b) Provided relevant information is sent to all SWWT members and discussed at all SWWT meeting, the topical group on programmatic issues will be suppressed as soon as the SW steering Board committee will be set up.
- (c) According to the new positioning of SEC it seems highly desirable to re-explore the possibility to consider space weather predictions as a part of environmental predictions. Actions are taken : to contact the national meteorological services (SWWT members, **Action 5**) and EUMETSAT (F. Lefeuvre, **Action 6**).
- (d) In order to increase the contact with defence, invite MoDs to the first European SW week. This suppose to have an introduction paper on defence (**Action 7** on F. Lefeuvre and C. de Matos) and that SWWT members send names and addresses to organizers (**Action 8**). R. Gendrin suggested that a relevant session be organized at the next workshop.
- (e) Investigate the possibility of organizing a NATO sponsored meeting on space surveillance. Military branches that should be targeted (somehow) include airforce and army telecoms. A task group has been defined. It includes E. Amata, M. Balikhin, S. Clucas, P. Gille, A. Glover, A. Hilgers, N. Jakowski, F. Lefeuvre. The list can be increased. First exchanges will start by e-mails (**Action 9**).

Programmatic issues were also discussed at the Programmatic session (july 21). Minutes are given in part B.

## 4. SW ESA ACTIONS

### Executive Committee

According to A. Hilgers, the Executive Committee will be the “SW steering Board Committee” referred to in point 3 of the Agenda. Nominations will be made by the ESA DG policy by September 15 2004. A. Hilgers and A. Glover will initiate the work of that Committee (**Action 10**).

Although it is too soon to draw all conclusions from the pilot projects (see below) it would be useful to make recommendations to the ESA management Board as if we were ready to submit a SW programme at the next ESA ministerial council. This will be the first task of the SW steering Board committee (**Action11**)

### Pilot projects

See A. Glover report

Works are in progress. SDA’s will deliver their final report starting in April 2005. The SWEENET services will be available nearly end of 2004. The financial evaluation is just starting

### R&D activities

R&D activities linked to space weather are ongoing since several years. New calls are regularly advertised in SWEN.

## 5. PROPOSALS TO FP6

### Public outreach proposal

F. Jansen reported about a proposal on public outreach to be organised between spring and November 2005. It is supported by a number of European countries (27 nearby countries are involved) and supported by COST 271 and 724. It also has backing from several companies. The proposal was rated excellent with all scores above the thresholds. However it is not funded presently. The proposers will examine what kind of supplementary support is needed.

### SW-RISK

FMI formulated a proposal similar to that of SWEET (SW-RISK) but it was considered too fragmented, over ambitious and so not funded. A new proposal under the umbrella of Aeronautics and Space (part of GMES) focussed on some aspects of space weather was also unsuccessful as it was considered 'not relevant' and that more research was required before any services could be provided. It was also pointed out that a mention of space weather appeared briefly in the FP6 call.

### SWEEPRA – Space Weather European Emerging Potential Risk Assessments

This is a new proposal to be written and submitted in mid September as a NEST INSIGHT instrument. It will focus on the risks due to GIC. The program will last for 24 months and be coordinated by FMI. It was pointed out that there is a need to include power companies in the list of participants as this will add more substance to the proposal which should demonstrate real problems due to GIC.

## 6. REVIEW OF THE ESA/COST/SWWT MEETINGS

A coordination meeting was organised on 28<sup>th</sup> November 2003 at the initiative of E-STAR . It was agreed that E-STAR will concentrate on solar variability and climate and that SWWT and COST 724 will consider the other SW aspects. Collaborations will be necessary for topics involving the different communities.

A second coordination meeting was organised on 2<sup>d</sup> February 2004 at the initiative of COST 724. It was agreed that in the organization of the first European SW week and in the development of a European SW web site, COST 724 will take the responsibility of all what was related to the scientific aspect of SW whereas ESTEC and SWWT will take the responsibility of all what was related to the operational aspects. Actions were taken to make use of the SWENET software infrastructure website to disseminate COST 724 output.

Since February, two coordination meetings have been organized to prepare the first European SW week.

## 7 DIAS – DIGITAL UPPER ATMOSPHERE SERVER

The DIAS project ([www.iono.noa.gr/DIAS](http://www.iono.noa.gr/DIAS)) was presented by A. Belehaki. This project is in its first phase of implementation. Its task is to monitor and forecast ionospheric changes over Europe, which includes collection of new and historical data sets, their management and distribution and promotion of activities. The project is funded for the period March 2004 - Feb 2006 and will provide a service for Europe.

## 8. TOPICAL GROUP REPORTS

### **Fundamental research (H. Lunstedt)**

A web page has been created outlining various key topics of research

<http://www.lund.irf.se/HeliosHome/fundamentalresearch.html>

### **Ground Effects (R. Pirjola)**

This group deals mainly with the effects of GIC in power and pipe lines. A web page is currently being created to give details of GIC calculation

<http://www.lund.irf.se/HeliosHome/groundeffectstg.html>

### **Atmospheric effects (A. Blusson)**

See A. Blusson report. A web page is currently under construction.

### **Ionospheric effect (L. Cander)**

A short review was given at the programmatic session. Information can be found at <http://www.ionoef.rl.ac.uk/>

### **Space and Aircraft effects (A. Hilgers)**

The topical group was constructed from the participants to pilot projects. A check has to be made with the list of persons who registered in the topical group (A. Hilgers **Action 12**). It was pointed out that there is a need to harmonise the way in which forecasts and alert thresholds are specified. Errors rates and access to services should also be considered It may be beneficial to consider space and aircraft communities separately

### **Education (N. Crosby)**

This should target emerging markets such as health and climate change. It was suggested that a splinter meeting to address these areas should take place at ESTEC. The group's web site contains links to various topical sites. Future ideas may include the production of a newsletter. A questionnaire was circulated to try and determine the views of SWWT members and others but response was very poor. It was decided to recirculate it again in the hope of a larger response (N. Crosby, **Action 13**).

### **AOB**

It was suggested to delete the discussions on the respective actions of topical groups and SWWT to the July 21 programmatic session.



## B. SWWT meeting continuation/programmatic session 21<sup>st</sup> July 21 2004

### Present

L. Cander, RAL  
 M. Candidi, IFSI/CNR  
 S. Clucas, QinetiQ  
 N. Crosby, BIRA  
 P. Gille, LPCE/CNRS  
 A..Glover, ESA-ESTEC  
 A..Hilgers, ESA-ESTEC  
 B. Jones, Solar Metrics Limited  
 A. Krankowski, Univ Olstyn  
 F. Lefeuvre, LPCE/CNRS  
 H. Lühr, GFZ  
 H. Lundstedt, Sweedish Institute f Physics  
 M. Menvielle, CETP/CNRS  
 R. Pirjola, FMI  
 J.Y. Prado, CNES  
 A.. Pulkinen, NASA/GSFC  
 D. Rodgers, QinrtiQ  
 I. Shagemugatov, Izmiran  
 S. Stankov, DLR  
 I..Stanislawska, SRC PAS  
 P. Velinov, BAS  
 J. Watermann, DMI

### 1. Clarification about the topical groups

The current structure of the SWWT including topical group was discussed. J. Watermann proposed to make the topical groups more flexible. For so doing, a steering committee would be in charge of identifying opportunities and circulating e-mails to all SWWT members. Natural selection would then place to smaller groups of people. Several participants disagreed pointing out the success so far of joint topical group meetings held to date and the interest of the web sites which are presently accessible. Now, to take into account of the fact that several SWWT members registered in one or two topical groups may be interested by items of information circulated in other topical groups, it was agreed that any initial information would be circulated to everyone in the SWWT and then the detailed discussion would take place within the topical groups. This supposes that before initial or/and critical information circulated within a topical group be copied to A. Glover and F. Lefeuvre in due time for a circulation to all SWWT(**Action 14**).

### 2. Does the SW perimeter need to be modified?

The question of modifying the SW perimeter came from : (i) the new status of the NOAA/SEC centre within the US weather service, and (ii) the thematics such as defence, near Earth objects and debris which are mentioned in the EU white paper about Space (see the “context” part of section 3 in the minutes of the 19<sup>th</sup> july SWWT meeting).

Actions with defence were already taken in the 19<sup>th</sup> july SWWT meeting (Actions 7, 8 and 9). The interest of a SW expertise for debris and near Earth objects has to be discussed, for instance with ESTEC and ESOC specialists (A. Glover, A. Hilgers, Action 15). But the SWWT must avoid to be embedded in a too large community already well organised.

Discussions with the European weather community are needed at two levels :

- EUMETSAT which could be interested to SW effects as a space agency,
- Meteo national agencies without which EUMETSAT will never take any action.

In order to prepare the contacts, then to initiate them, several actions have been taken:

- to edit a shorter and updated version of the SW briefing package, in order to have a relevant document to give to the persons SWWT members have to contact (A. Glover, A. Hilgers, F. Lefevre; **Action 16**).
- to contact Meteo national delegates (**Action 5** already taken)
- to contact EUMETSAT (F. Lefevre, **Action 6**, already taken).

During the preparation of SW-RISK, it was noted that SW services could be important for the real time survey of forest fires. However this supposes a constellation of dedicated satellites. DLR launched a first test satellite. H. Lühr will try to review the present status of dedicated satellites for forest fires (**Action 17**):

## C. SUMMARY OF THE ACTIONS

**ACTION 1** Take part into the preparation of the space and security parts of the FP7 programme or at least contact the national representatives to include space weather (SWWT members, actions have to be engaged in September 2004).

**ACTION 2** To set up a sub-group in charge of exploring space weather and long term phenomena (F. Lefeuvre, M. Candidi, J. Liliensten), other volunteers must contact F. Lefeuvre before September 15.

**ACTION 3** After first exchanges between sub-group members, to contact Commission officers in Brussels to see how proposals on long term phenomena could be received (F. Lefeuvre, M. Candidi, J. Liliensten, before SWWT16 meeting) .

**ACTION 4** To consolidate the list of effects for the Halloween storms following the SEC approach (see website in the text). (F. Jansen, M. Candidi, , etc.; before SWWT 16 meeting).

**ACTION 5** To contact the national meteorological services (SWWT members, as soon as possible)

**ACTION 6** To contact EUMETSAT (F. Lefeuvre, September 2004).

**ACTION 7** To invite a speaker to talk about defence at the first European SW week (F. Lefeuvre, C. de Matos, first week of September 2004)

**ACTION 8** To send to A.GLOVER addresses of defence and/or security persons to invite to the first European SW week (SWWT members, September 30 2004)

**ACTION 9** To initiate the works of the task group on defence and security (F. Lefeuvre, September 30 2004)

**ACTION 10** To initiate the work of the SW steering Board Committee (A. Hilgers and A. Glover, September 30 2004).

**ACTION 11** To make recommendations to the ESA management Board as if we were ready to submit a SW programme at the next ESA ministerial council (SW steering Board committee, deadline to be defined)

**ACTION 12** To check the list of persons who registered in the topical group Space & Aircraft (A. Hilgers, September 30 2004)

**ACTION 13** To re-send the questionnaire on public outreach to all SWWT members (N. Crosby, September 30 2004).

**ACTION 14** To copy all new or/and critical information circulated within a topical group to A. Glover and F. Lefeuvre in order to diffuse it to all SWWT (spokespersons).

**ACTION 15** To examine with ESOC and ESTEC the interest of a SW expertise for debris and near Earth objects (A. Glover, A. Hilgers, next SWWT meeting).

**ACTION 16** To edit a shorter and updated version of the SW briefing package (A. Glover, A. Hilgers, F. Lefeuvre, 30 September 2004).

**ACTION 17** To review the present status of dedicated satellites for forest fires (H. Lühr, next SWWT meeting ):