

MINUTES OF THE 16th SWWT MEETING ESTEC - 1st December 2004

AGENDA

1. Welcome, F. Lefevre
2. Adoption of the Agenda
3. Action Review from Previous Meeting (cf attachment)
4. Activities of Topical Groups - Topical group leaders
5. Pilot Project Mid-Term Review - A. Hilgers/A. Glover
6. IPY, eGY, IHY ... (topics introduced by M. Candidi in the GEN1 session) M. Candidi
7. Status of COST 724 Action , J. Lilensten
8. Joint SWWT COST724-WG4 meeting,
9. Coordination of ESA Space Weather Applications Activities with COST Action 724 F. Jansen/J. Lilensten/A. Hilgers
10. Roadmap/Perspectives (F. Lefevre/J. Lilensten/A. Hilgers)
11. Next meeting
12. AOB.

1. WELCOME

François Lefevre recalled points of the agenda already introduced during sessions of the 1st European Space Weather Week:

- a) perimeter of a future European Space Weather Programme (in Action review from previous meeting);
- b) Pilot project Mid-Term Review;
- c) IPY, eGY, IHY;
- d) Roadmap perspectives.

2. ADOPTION OF THE AGENDA

Points 7 and 9 will be merged, as will points 5 and 10.

3. ACTION REVIEW FROM PREVIOUS MEETING

ACTION M15/1 - Take part in 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).

Paul Gille reported about actions in direction of FP6 and FP7 (see Annex A).

About FP6, several SW proposals have been submitted in September 2004. Some passed the first step. Others are waiting for an EU answer.

About the preparation of FP7, his personal action allowed to include Space Weather topics in the French GMES preliminary text (see Annex A, point 3). No action of that type was reported by the audience. Although most of the Member States contributions are nearly completed, very urgent actions from SWWT members may still be possible (Action M16/1).

During the discussion it was pointed out that the term "Space Weather" being included in the EU "white paper" about space sciences, one may expect messages on that topics from Member states. If it is the case it may be useful to discuss with EU officers about the most appropriate context and tools.

Following Paul Counet's talk during the 29th November Gen1 session of ESWW, Francois Lefevre suggested to discuss that point at the beginning of 2005 in Brussels. The meeting is supposed to be organized with the Space Policy Unit. Presently it is not clear if a similar meeting can be organized with GMES, or if GMES officers could be invited to that meeting. The first objective is to determine how requests from Member States could fit with what the European SW community may offer. The full action is completed after the discussion of point 6 in the agenda.

ACTION M15/2 - To set up a sub-group in charge of exploring space weather and long term phenomena (F. Lefevre, M. Candidi, J. Liliensten), other volunteers must contact F. Lefevre before September 15.

Action closed. The sub-group has been set up.

ACTION M15/3 - 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. Lefevre, M. Candidi, J. Liliensten, before SWWT16 meeting).

M. Hapgood reported on the UK Earthshine project. Information on this project may be found on <http://www.sstd.rl.ac.uk/EARTHSHINE/earthshine.html>. The Project Scientist is M. Lockwood, the Science Coordinator is R. Stamper. The objective is to answer key questions about how Earth's climate and space environment are affected by the Sun. The satellite will have a stable halo orbit around L1. M. Hapgood suggested a use of EISCAT for studies on SW and climatology after 2006. Space Weather and climatology is an E-STAR thematic. It was suggested to organize a meeting on SW & long term phenomena (Action M16/2).

ACTION M15/4 - To consolidate the list of effects for the Halloween 2003 storms following the SEC approach (F. Jansen, M. Candidi, etc.; before SWWT 16 meeting).

The action remains open. Other storms have been observed since October-November 2003. In the future, it is still suggested to present effects affecting Europe in the SEC format.

ACTION M15/5 - To contact the national meteorological services (SWWT members, as soon as possible)

This action is ongoing.

ACTION M15/6 – To contact EUMETSAT (F. Lefevre, September 2004)

François Lefevre reported on the origin of Actions M15/5 and M15/6 and on discussions in progress. The actions were taken in the aim to identify a way to extend to the meteorology the perimeter of a future European Space Weather programme.

Dr Lars Prahm (Director-General of EUMETSAT) was invited to present a talk on EUMETSAT and Space Weather at the first European Space Weather Week. He replied that EUMETSAT was not interested by Space Weather but that the situation could change if there were demands from Member States. In a second letter, answering to the proposal that pilot projects could be presented to the EUMETSAT Science and Technical Group (STG) he wrote «I would like to suggest that you keep us informed about the role of the SWWT by sending us reports and important information. The reports you should send directly to our expert on radio occultation measurements, Juha-Pekka Luntama, EUMETSAT, Meteorological division». During the discussion, it was mentioned that Juha-Pekka Luntana will come to work at FMI, in space weather business, summer 2005.

Contact with Meteo France was taken with Paul Gille, with the following conclusions:

- (a) an interest of the defence sector for Space Weather would be a strong signal for meteorology (meteorology has civilian and military customers),
- (b) an evaluation of the Space Weather impact on meteorology services has not been done so far but that in the context of ESA funding (with possibly a EUMETSAT contribution) it could be useful to work on statistical correlations between service limitations in EUMETSAT satellites and solar events,
- (c) presentations to National services of the results of pilot and/or dedicated projects could allow to identify the interest of a European Space Weather programme for meteorological programmes, and consequently for EUMETSAT.

The strategy proposed to the SWWT members by François Lefeuvre was to contact several national meteorological services in a similar way, in order to both present relevant results from the ESA pilot projects, and to identify projects which could allow to test the importance of the Space Weather effects in meteorology.

J Watermann – announced that he will contact the new director of DMI on that basis (Action M16/3)

M Hapgood – in RAL, reported that he was already having discussions, he was enthusiastic that results will be obtained possibly next year.

K Kauristie – also from a meteorological institute (FMI) – reported that she would need to have some concrete plans in order to make a proposal. She would need a collaboration and information where that type of information could be used and where.

Four national services could then be involved (Denmark, Finland, France, UK). Similar initiatives are expected in other countries.

As regards to potential new projects, Alain Hilgers reminded that formally the tender action for the space weather pilot project is close but that possible support from ESA can always be sought through the existing possibly relevant R&D programmes (Information regarding open and intended Invitations to Tender is available via the ESA EMITS system (<http://emits.esa.int>)).

Returning to the contacts with EUMETSAT it was considered that the present priority was to approach the National Committees. However, Alain Hilgers emphasized on the strategy to be used. . . EUMETSAT is not only a potential customer but also a potential key element in the service provision chain. As an example METOP spacecraft (to be launched in 2005) will embark a space environment monitor (SEM) which may constitute the first recurrent space weather hardware. It will be difficult to convince EUMETSAT of the interest of Space Weather for Europe if nobody show any interest for the exploitation of existing data obtained from monitors on meteorological satellites. The Meteorological instrument is the same SEM instrument as on the NOAA spacecraft (:<http://www.eumetsat.de/en/index.html?area=left2.html&body=/en/area2/cgms/ap10-14.htm&a=284&b=2&c=280&d=200&e=0>). Access is possible via contact with national delegates. Information on open calls referring to potential Metop data use will be sent to the SWWT members (Action M16/5). He also pointed out ambiguity as to whether the response of Dr Lars Prahm refers to space weather effects on Eumetsat spacecraft or effects on any s/c.

Finally it was decided (Action M16/6 on J Watermann, M Hapgood, K. Kauristie and P. Gille, but also on all SWWT members):to contact (or to pursue contacts with) national meteorological services in order:

- (i) to introduce the idea of the inclusion of SW as a new meteorological service,
- (ii) to present relevant results from the pilot projects
- (iii) to identify studies which could allow meteorological services to have a better view of the role of Space Weather in EUMETSAT service limitations,

ACTION M15/7 To invite a speaker to talk about defence at the first European SW week (F. Lefeuvre, C. de Matos, first week of September 2004)

This action is closed. No appropriate speaker was available to attend the ESWW.

F. Lefeuvre and C. de Matos decided to set up a mixed sub-group on defence (including SWWT members + members of European defence organizations) before taking any action (see Action M15/9 below).

ACTION M15/8 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)

None received.

ACTION M15/9 To initiate the works of the task group on defence and security (F. Lefeuvre, September 30th 2004)

F. Lefeuvre reported on several actions taken since last SWWT. After a contact with the organizers, a SW presentation has been submitted to the 1st AAF international conference – "Military space: Questions in Europe", April 25 – 27, 2005, Paris.

Members of national defence organizations in Europe have been contacted to participate to a scientific committee in charge of the organization of a dedicated meeting (for example a NATO meeting) or of a dedicated session in an existing meeting. As for meteorology, the idea is to get an agreement with potential SW users before taking any initiative. Supplementary names are being identified (Action M16/7).

The present members of the SWWT defence sub-group are :E. Amata, M. Balikhin, P. Cannon, S. Clucas, C. Dyer, N. Jakowski, F. Jansen, P. Gille, A. Glover, A. Hilgers, F. Lefeuvre

ACTION M15/10 To initiate the work of the SW steering Board Committee (A. Hilgers and A. Glover, September 30 2004).

The ESA GSP management did not recommend to set-up a new formal group such as a SW steering Committee therefore Alain Hilgers suggested instead to set up an informal coordinating committee including the chairs of entities involved in scientific and/or operational SW activities (SWWT, COST, etc.). This idea will be submitted to the SWWT partners (Action M16/8).

ACTION M15/11 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)

Alain Hilgers stated that it is not considered as appropriate by GSP management to introduce any major initiative related to space weather at the next council meeting (December 2005). Also, the ESA management board is expected to be first informed of the results of the study when it has come to an end (~summer 2005). This means that the next opportunity to get a programme proposal submitted to council is for year 2008. Discussion started about what can be done in the next steps.

ACTION M15/12 To check the list of persons who registered in the topical group Space & Aircraft (A. Hilgers, September 30 2004)

Action closed.

ACTION M15/13 To re-send the questionnaire on public outreach to all SWWT members (N.

Crosby, September 30 2004).

Action closed.

ACTION M15/14 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 (TG spokespersons)

On going.

ACTION M15/15 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 in progress (new Action M16/9).

ACTION M15/16 To edit a shorter and updated version of the SW briefing package (A. Glover, A. Hilgers, F. Lefeuvre, 30 September 2004)

The work started on the elaboration of a new issue of the SW briefing package. This was temporarily stopped pending discussion with J. Lilensten and M. Fuellekrug when it appeared that a joint briefing pack, written together with COST and E-STAR could be needed. Although very short, the SW briefing package must be general enough to cover all activities in Europe. Agreement is needed as to whether a single briefing pack covering the interests of the SWWT, COST 724 and E-STAR should be produced. If so, François Lefeuvre proposed to set up a small sub group for that purpose. Alain Hilgers suggested to construct it around the informal Committee defined after Action M16/8. A first proposal will be submitted to the members of that committee and to interested SWWT members (Action M16/10).

ACTION M15/17 To review the present status of dedicated satellites for forest fires (H. Lühr, next SWWT meeting)

Action open.

4. ACTIVITIES OF TOPICAL GROUPS.

Ionospheric effects (<http://www.ionoef.rl.ac.uk/>) Lili Cander summed up the meeting of the topical group. After discussion, the term of reference remains the same. It will be reviewed in 1 year. The list of membership will be reviewed. The Website is ready. More contributions are needed. There is a promise from Iwona Stanislawska to make a contribution this year. The MIERS new COST action was reviewed. This was followed by SWENET presentations.

Education, outreach and emerging markets (<http://plasma.oma.be/EOEM/ESA-Topical-Group/index.html>) Norma Crosby summarized the main points. The Webpage is prepared and online. There is an action on Alexi Glover to update the website and to make links to SWWT pages (Action M16/11). Norma mentioned that the questionnaire was circulated during the topical group meeting and during the workshop at large. As regards to the emerging markets, health aspects must be considered. Climate effects is now broader and part of atmospheric changes community. A WG has been established at ISU. Former soviet union authors are making a reference list. A workshop has to be organised on the subject. Information will be put on website.

Ground effects (<http://www.lund.irf.se/HeliosHome/groundeffectstg.html>) Risto Pirjola recalled that the topical group meeting will be on 2d December. His report is given in Annex B.

Spacecraft and Aircraft environments

(http://www.estec.esa.nl/wmwww/wma/spweather/esa_initiatives/swwt/TG/index.html) Alain Hilgers recalled that the topical group meeting will be on 2nd December. The spacecraft and aircraft group

will probably be divided in 2 groups. They plan to work on common scales indices and alert thresholds.

Other topical groups web sites :

Fundamental research (<http://www.lund.irf.se/HeliosHome/fundamentalresearch.html>)

Atmospheric effects (http://www.cls.fr/previsol/html/swwt_group_en.html)

5. PILOT PROJECTS – MID-TERM REVIEW

Alain Hilgers recalled the main points of his power point presentation at the Gen1 session (see copy of his slides)

6. IPY, eGY, IHY

Maurizio Candidi recalled that, in 2007 to 2009, for the 50th anniversary of the International Geophysical Year (IGY) several research initiatives are underway

- the International Polar Year (IPY)
- the electronic Geophysical Year (eGY)
- the International Heliospheric Year (IHY)

Space Weather topics may be introduced in each of these initiatives. An action from the European SW community would make it visible and could help in the establishment of a European Space Weather Programme. This supposes to present a programme or a proposal for an event. François Lefeuvre agreed on that suggestion and call for ideas. Practical questions about the procedure and the submission (independently or through national committees; international or European event, ..) were discussed. Alain Hilgers suggested that a contribution to IHY or eGY may take may be based on running appropriate elements of SWENET. This could offer an opportunity for a continuation after the pilot projects end. Maurizio Candidi considered that it was a good start and that it could be used as the basis for a proposal. Suggestions were made about ground based data. , ..

In any case, the point is to know with which initiative there is a better fit (eGY?, IHY?) and where the funding could be found.

Three actions were taken :

- to ask the SWWT members to make (other) suggestions of programme or event for the IGY and to send them to M. Candidi, A. Hilgers and F. Lefeuvre, (Action M16/12),
- to select the best one and define a SW proposal (Action M16/13)
- to examine with the EU Space policy unit possibilities of funding for a European programme and/or event (to be included in Action M16/2)

7. STATUS OF COST 724 ACTION

Anna Belehaki – presented status of COST 724. The structure is fully defined. There are 4 WGs. The WG leaders have been nominated. COST 724 is the largest COST action (24 countries). She hopes that the collaboration started with COST 271 will continue with next COST 296. It is already decided to organise a European space weather week. But it is not yet sure when or where. Anna. Belehaki hopes that until next MC meeting in Vienna more details will be known. COST 724 has a session in Vienna. They will try to have no overlap with the SWWT meeting. They started to work on the organisation of a summer school on space weather in 2006. The organisation must be started now. The ICTP in Trieste is the most likely location.

François Lefeuvre emphasized on the interest of having SWWT and COST meetings at more or less the same time and the same location. Anna Belehaki pointed out that it will be the case at EGU. COST 724 will have 2 days meeting before the EGU.

8. JOINT SWWT COST 724 – WG4 MEETING

Franck Jansen presented the work programme of the COST 724 WG4. He pointed out that SWENET is already in a work package but that supplementary contributions is expected. François Lefeuvre agreed that COST 724 and SWWT had the same objectives and suggested a dedicated meeting with Alain Hilgers about a support to WG4 (Action M16/14).

9. NEXT MEETING

Next SWWT meeting will take place during the EGU meeting. Thanks to Professor W. Riedler, the meeting will be organised at the Academy of Sciences' main building in the city center (easily to be reached from the EGU venue) on Tuesday April 26, 2005 from 14 to 18 h.

SUMMARY OF the 16th meeting ACTIONS

Action M16/1 - To introduce Space Weather topics in documents to be sent by Member States to prepare FP7 (All SWWT members, before 31 December 2004).

Action M16/2 - To organise a meeting (or two separated meetings) with officers from the European Space policy unit and GMES officers (P. Gille, F. Lefeuvre, 31 December 2004).

Objectives: (i) to figure out where in the FP7 tools Space Weather topics could fit both with the Member States suggestions and with what the European Space Weather community may offer, (ii) to identify possible supports for a SW contribution to IPY, eGY, IHY.

SW delegation: M. Candidi, A. Glover, P. Gille, A. Hilgers, F. Lefeuvre, J. Liliensten.

ACTION M16/3 – To organize with E-STAR a meeting on SW & long term phenomena.(F. Lefeuvre, M. Candidi, J. Liliensten, next SWWT meeting).

ACTION M16/4 - To provide on request a Pilot Project briefing package (A. Hilgers, 6th January 2005)

ACTION M16/5 - To send to the SWWT members information on potential Metop data use calls (A. Hilgers, 6th January 2005).

ACTION M16/6 - To contact (or to pursue contacts with) national meteorological services in order: (i) to introduce the idea of the inclusion of space weather as a meteo service, (ii) to present relevant results from the pilot projects, (iii) to identify studies which could allow meteorological services to have a better view of the role of Space Weather in EUMETSAT service limitations (J Watermann, M Hapgood, K. Kauristie and P. Gille, + SWWT members who can have a contact with their national service, 15th February 2005).

ACTION M16/7 - To find supplementary members of national defence organizations to constitute a scientific committee in charge of the organization of a dedicated meeting (for example a NATO meeting) or of a dedicated session in an existing meeting (E. Amata, M. Balikhin, P. Cannon, S. Clucas, C. Dyer, N. Jakowski, F. Jansen, P. Gille, A. Glover, A. Hilgers, F. Lefeuvre, 28 February 2005).

ACTION M16/8 - to set up an informal coordinating committee including the chairs of entities involved in scientific and/or operational SW activities (A. Glover, A. Hilgers, F. Lefevre; 6th January 2005).

ACTION M16/9 - 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 M16/10 - To submit a proposal of SW briefing package to the members of the informal Committee defined in Action 8 and to interested SWWT members (F. Lefevre, end mid February 2005).

ACTION M16/11 – to update the website and to make links to SWWT pages (A. Glover)

ACTION M16/12 – To make suggestions for a SW programme or event during the IGY and to send them to M. Candidi, A. Hilgers and F. Lefevre (All SWWT members, end of March 2005)

ACTION M16/13– To select a SW proposal for the IGY (M. Candidi, A. Hilgers and F. Lefevre , next SWWT meeting)

ACTION M16/14 – To get an ESTEC support for the COST 724 WG4 (M. Candidi, F. Jansen, A. Hilgers and F. Lefevre, as soon as possible)

ANNEXE A - REPORT FROM PAUL GILLE (CNRS/LPCE - ORLEANS, FRANCE)

From FP6 to FP7 for Space Weather

1. FP6 remaining opportunities (December 2004) :

GMES 3

(not yet open)

AO foreseen between December 2004 and March 2005;

Expected budget : 35 M€

Overbooking in order to spend the remaining budget !

Main fields and instruments :

3 IP's : **Security** , Water resources, GMES operational scenario

some SSA, CA, STREP : education & training, user networking & international cooperation

Open fields : **Space weather possible**

2. Recall: SW and the European Union

SW was not a primary topic inside FP6, therefore several **meetings** were organized in Brussels DGRTD , for mutual information of SW community and scientific officers, Space policy unit, Aeronautic & space, IST, Global change.

This was done during the ESA study : European structures for SW (25/01/2002), and in the context of Expression of Interest or submission of projects : SWEET (8/10/2002), SWRISK (22/09/2003), GREPON (GIC, 2/09/2004).

Presently, the raw result is **limited**, considering miscellaneous possible **entry** points :

- Aeronautics & **Space** : GMES (Risk management), Galileo, Communication Satellites : **no success** (due to the low adequacy of these thematics to SW).

- Integrated **Infrastructure** Initiatives (I3) : a large project ISRSI “**Integrating Space Radiation Sensing Infrastructures**”, very well estimated, but not funded this year, has to be **resubmitted** in 2005.

- **NEST**/ INSIGHT “**Geomagnetically induced currents, Risk in the European power network**” (GREPON), a STREP submitted by FMI, LPCE, BGS, DMI, Univ. of Sheffield, NRCAN, with expertise by EDF (French agency for electricity). Outlook proposal presently **under evaluation** (dec 2004).

- EODIST, **Enabling on-line distributed information & sensor technologies for space & earth observations**, FP6-2002-**IST**-C FET, short proposal under **negotiation** (LOIS-LOFAR).

- eContent, DIAS : “**Europeans digital upper atmosphere server**” is a demonstration project, **funded** in 2004, to develop a pan-European digital data collection on the state of the upper atmosphere (Establishment of European digital data collections).**3. Evolution from FP6 to FP7**

General trends : Evolution, not revolution

More **fundamental** science, More **funding** : factor 2 ?

Old thematic priorities are kept; New fields : **space** , **security**

EU enlargement (25) : New Commission : new Directorates ? new commissioners, new officers ...

Extension of instruments : Private – public – partnership = PPP

“**Technological platform**”

Joint technological initiative = JTI

Joint undertaking : GMES after Galileo

Schedule : **just in time** (end 2004) FP7 preliminary documents are in preparation at each national level.
to introduce new concepts in future work programme
to contact National contact points (NCP)

In **France**, with a strong industrial support, some reference is introduced inside the Space / GMES chapter,

Research related to future space missions of observation : the long term measurement required by GMES need to set up **space observatories** applied to 4 kinds of environment, including :

“*electromagnetic environment allowing the identification of accidental or intentional pollution liable to disturb radio communications*”.

Question/ action to SWWT :

to collect/synchronize **all national FP7 initiatives** by all Member States
to organize soon a new information **meeting with Brussels officers**

ANNEXE B

Ground Effects Topical Group (GETG) of ESA Space Weather Working Team (SWWT)

Risto Pirjola (FMI, Finland)

“European Space Weather Week” – ESTEC, November 29 - December 3, 2004

List of present members:

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

managed by Magnus Wik at IRF Lund

Terms of Reference

Summary:

At the Earth's surface, space weather manifests itself as geoelectromagnetic effects. Geomagnetic activity is increased, i.e. the geomagnetic field becomes disturbed, in other words, a geomagnetic storm occurs. The geoelectric field drives currents, called geomagnetically induced currents (GIC), in man-made conductors, such as electric power transmission systems, oil and gas pipelines, telecommunication cables and railway equipment. GIC may cause problems to the systems: transformers can be saturated, pipelines may suffer from enhanced corrosion, and telecommunication and railway systems can experience overvoltage.

General Activities:

- Modelling the occurrence of geomagnetic variations and geoelectric fields during space weather events
- Modelling GIC in electric power systems (discrete earthings)
- Modelling GIC in buried pipeline networks (continuous earthing)
- Measurements of geomagnetic variations, geoelectric fields and GIC
- Development of forecast techniques of GIC based on neural networks or on physical models
- Collaboration with power and pipeline industry on GIC research
- Advice on and forecast of geomagnetic activity to users, such as oil drilling and prospecting industry and aeromagnetic survey enterprises

Recent activities:

- Construction of GETG Web page at IRF Lund (Magnus)
- Collaboration within the "GIC Simulator / David et al.", "GIC Forecast / Henrik et al.", "Solar Wind and GIC / Alan et al." and "GIC Now! / Ari et al." SDAs
- Reference power system and pipeline network data available on the GETG Web site to be used for testing of GIC calculation programs (provided by Antti)
- Submission of the GREPON ("Geomagnetically Induced Currents (GIC) Risk in the European Power Network") STREP pre-proposal to EU FP6 in the NEST INSIGHT area (Risto et al.)
- Discussions about the calculation techniques of GIC in a power system when the geoelectric field and the network parameters are the input
- Discussions about time-domain and frequency-domain calculations of the geoelectric field

Studies of the effects of series capacitors and neutral point reactors on GIC in a power system