

# Space Weather Working Team Plenary Meeting 27 Report

## 18 June 2010, Brussels, Belgium

Prepared by Norma Crosby, 8 July 2010

The SWWT Plenary 27 Meeting was hosted by the Royal Observatory of Belgium, Friday 18 June 2010, 09:30-17:00, and supported by the Solar Terrestrial Centre of Excellence (STCE). It was convened by Norma Crosby (NC) with Alexi Glover (AG) as ESA contact and was attended by 16 people (see Annex for two-page list of participants).

The meeting was divided into three main parts:

### 1. Welcome

#### PART 1 – SWWT UP-TO-DATE

2. Main Events since previous SWWT Meeting
3. Action Item Review
4. SWWT Topical Groups Update
5. Resumé of SWWT/ESPD Meeting (Norma Crosby)
6. SOTERIA (Giovanni Lapenta)
7. EPT Day (Mathias Cyamukungu)
8. SWWT Terms of Reference
9. SWWT Wiki
10. SWWT Roadmap

PART 2 – Technical Discussion: Space Weather Metrics Presentation + Discussion  
Presentation: Ioanna Tsagouri

#### PART 3 – PRESENTATIONS

1. SSA (Alexi Glover)
2. ESA R&D (Jens Rodmann)
3. FP7 / FP8 - the Way Forward (Mike Hapgood sent slides)
4. COST ES0803 (Anna Belehaki)
5. HELIO + CASSIS (Bob Bentley sent slides)
6. NATO SSA (Frank Jansen sent slides)
7. US/FEMA-EU/MSB (Henrik Lundstedt sent slides)
8. WMO (Alain Hilgers sent slides)
9. Any Other Business

## **[1.] Welcome**

NC welcomed the participants to the 27<sup>th</sup> SWWT Plenary Meeting and presented the above agenda. Due to conflicting schedules in the afternoon the SOTERIA presentation (Giovanni Lapenta) and the EPT Day presentation (Mathias Cyamukungu) was given in the morning under PART 1.

It was highlighted that this is the 10<sup>th</sup> anniversary of the SWWT.

For those not familiar with the SWWT an introduction to the background and objectives of the SWWT was given by NC. It was mentioned that MH remains as contact person for new memberships to the SWWT [ contact email: mike.hapgood AT stfc.ac.uk ]. For more information about SWWT, including minutes and presentations from previous SWWT Plenary meetings see:

[http://www.esa-spaceweather.net/spweather/esa\\_initiatives/swwt/index.html](http://www.esa-spaceweather.net/spweather/esa_initiatives/swwt/index.html)

## **PART 1 – SWWT UP-TO-DATE**

### **[2.] Main Events since previous SWWT Meeting**

#### Meetings:

- “Space Weather Working Team Steering Board meeting”, 17 November 2009, [European Space Weather Week 6, 16-20 November 2009, Brugge, Belgium]
- “Space Weather Working Team 26” Plenary meeting, 19 Nov. 2009, 14:00-16:00 [European Space Weather Week 6, 16-20 November 2009, Brugge, Belgium]
- “COST ES0803 User Workshop”, 22-24 March 2010, Scientific Center of the Polish Academy of Sciences in Paris, Paris, France
- “SWWT/ESPD splinter meeting”, 5 May 2010, 13:30-15:00 [European Geosciences Union General Assembly 2010, 2-7 May 2010, Vienna, Austria] [Co-convened by Stefaan Poedts (SP) and Norma Crosby (NC)]
- “Space Weather Working Team Steering Board meeting”, 17 June 2010, 14:00-18:00, Belgian Institute for Space Aeronomy, Brussels, Belgium.

#### Calls for Proposals-Invitations to Tender:

N Crosby highlighted some recent opportunities where SWWT members have been active:

FP7 Space Call project proposals [Deadline: Dec. 8, 2009]

- SPA.2010.2.1-03 Exploitation of space science and exploration data
- SPA.2010.2.3-01 Security of space assets from space weather events

Several proposals with space weather themes have been selected for negotiation which is currently ongoing. A full list of successful teams is expected to be available at the next European Space Weather Week.

ESA Invitation To Tender (ITT) project proposals:

- SN-I: Space Weather Services (IITT ref. 09.118.08)
- SN-II: Weather Instruments (IITT ref. 09.118.09)

These two studies form part of the new SSA preparatory programme and are expected to start in the coming months.

Events:

The attendees highlighted that several space weather events had occurred recently including:

- The Energetic Particle Telescope (EPT) Day, Louvain-la-Neuve, 4 June 2010
- Launch of PICARD, 15 June 2010 [PICARD is a new source of data and the main images “space weather events” will be available for space weather analysis.]
- PROBA2 [ <http://proba2.oma.be/index.html/> ], launched in Nov. 2009, is doing well. In May 2010 the beta data release of the science data products was announced.
- The Solar Dynamics Observatory (SDO) [ <http://sdo.gsfc.nasa.gov/> ] was launched on 11 Feb. 2010. [Instruments: Atmospheric Imaging Assembly (AIA), EUV Variability Experiment (EVE), Helioseismic and Magnetic Imager (HMI)]
- LOFAR (LOW Frequency Array), a multi-purpose sensor array, has been put online [ <http://www.lofar.org/> ]. Its main application is astronomy at low frequencies (10-250 MHz) but it also has geophysical and agricultural applications.

Currently ongoing:

- Ongoing CESRA conference [ <http://www.sidc.be/CESRA2010/> ], La Roche-en-Ardenne, Belgium, 15-19 June 2010.

### **[3.] Action Item Review**

*AI M26/1: NC, AG, HL – Coordination of the Fundamental Research topical group with the ongoing Cost Action ES0803 in regard to science to applications. [ONGOING]*

It is being investigated with Henrik Lundstedt how best to coordinate this topical group with the ongoing Cost Action ES0803 in regard to science to applications. Henrik will continue to take an active involvement and will collect updates regarding solar related space weather research. Updates from SOTERIA and Cost Action ES0803 will be included (channeled into) in the “Fundamental Research” yearly report.

*AI M26/2: NC/AG to send out contact information for Steering Board to SWWT mailing list. Prior to this the individual Steering Board members will be asked if they agree to have their contact details listed on the SWWT web-page:*

[http://www.esa-spaceweather.net/spweather/esa\\_initiatives/swwt/index.html](http://www.esa-spaceweather.net/spweather/esa_initiatives/swwt/index.html)

*[ONGOING]*

Prior to the SWWT Steering Board meeting some of the existing members had indicated that they would be replaced owing to potentially conflicting involvement in SSA activities. Once this has been finalised the information will be made available on the SWWT web-page.

*AI M26/3: NC to add FP8 to the agenda of next SWWT plenary meeting. [DONE]*

[ The presentation “FP7/FP8 – the Way Forward” is part of the SWWT Plenary 27 Meeting agenda (see PART 3, Item 3). ]

*AI M26/4: AG and Ronald Van der Linden to find out what has happened to the UN decision paper on SSA-Space Weather and whether there could be a link between this and the SWWT initiative. [ONGOING]*

Ronald Van der Linden’s name was added to this AI, as he is a member of the group tasked with drafting this decision paper.

The forty-seventh session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (UNCOPUOS) was held from 8 to 19 February 2010 at the United Nation Office at Vienna, Vienna International Center, Vienna, Austria, <http://www.unoosa.org/oosa/COPUOS/stsc/2010/docs.html> .

In regard to the above UNCOUOS has produced a document regarding the “Long-term sustainability of outer space activities”, see

[http://www.unoosa.org/pdf/limited/c1/AC105\\_C1\\_2010\\_CRP03E.pdf](http://www.unoosa.org/pdf/limited/c1/AC105_C1_2010_CRP03E.pdf) .

UN Capacity Building workshops were also mentioned.

#### **[4.] SWWT Topical Groups Update**

An overview of the SWWT structure was given by NC and thereafter she gave an update on the individual topical groups:

- Ground Effects: Larisa Trichtchenko (LT)  
On behalf of LT, NC presented a report that LT had prepared that covered publications/reports, presentations and projects.
- Ionospheric Effects: Juha-Pekka Luntama
- Spacecraft Launcher and Aircraft Environments: Susan McKenna-Lawlor (SMcKL)

On behalf of SMcKL, NC presented a report that SMcKL had prepared that covered updates since SMcKL took over as spokesperson and current tasks.

- Fundamental Research: Henrik Lundstedt (HL)

- Atmospheric Effects: Sean Bruinsma (SB)

A presentation was given by SB and included an overview about the Advanced Thermosphere Modelling for Orbit Prediction (ATMOP) FP7 Space call project proposal, as well as an ESA AO “GOCE+ Thele 3: Air density and wind retrieval using GOCE data”.

- Education, Outreach and Emerging Markets: Norma Crosby

NC presented the new book “Sola – vår livgivende stjerne” that has been written by Pål Brekke. The book explains how our closest star works (translated to other languages is being investigated). An update about the “I Love My Sun” event provided by Yurdanur Tulunay was given. More information and updates can be found here at <http://eoem.aeronomy.be/>.

Individual topical groups will provide input to NC in early autumn 2010 for the annual European space weather report regarding their activities during the last year. NC has recently reminded the spokespeople of the above SWWT Topical Groups of this.

## **5. Resumé of SWWT/ESPD Meeting (Norma Crosby)**

The main goal of the joint Space Weather Working Team (SWWT) / European Solar Physics Division (ESPD) meeting was to investigate how more contact between the SWWT community and the ESPD community could be imagined having “applications” in mind. The meeting was co-convened by Stefaan Poedts and Norma Crosby. This meeting came about during discussions at the previous SWWT Plenary at ESWW6 during which Stefaan Poedts gave a short presentation about ESPD.

At the current SWWT Plenary meeting a short introduction to the ESPD community was given followed by some ESPD Updates. Thereafter NC highlighted a couple of the main items that had been discussed during the SWWT/ESPD splinter meeting:

- Traditionally data has been flowing from STP research to space weather applications. Hanna Rothkaehl noted though that there has been a change in this one-way flow between the two fields during the last years and that a two-way flow has emerged. Now large scale monitoring and data outputs from space weather tools are sometimes used as input to STP data analysis and models, whereafter the output of the STP research is sent back to the space weather tools.
- The European space weather “user community” continues to expand and new users of space weather products continue to grow. Andrew Coates commented that following the recent extended period of solar minimum users from the insurance industry have started to contact the scientists again. This is a good sign

and supports efforts in space weather education to attract potential space weather users.

- To avoid future meetings that are organised by the different communities (ESPD, CESRA, JOSO, EAST, SWWT) in overlapping the attendees suggested a joint European Space Weather Portal / ESPD Calendar for this purpose. Centralising the information would benefit everybody.

NC reminded the participants that the minutes of the meeting are available online:

[http://www.esa-spaceweather.net/spweather/esa\\_initiatives/swwt/docs/index.html](http://www.esa-spaceweather.net/spweather/esa_initiatives/swwt/docs/index.html)

Sean Bruinsma commented that there were similarities between the objectives of ESPD and CAWSES (Climate and Weather of the Sun-Earth System). CAWSES is an international program sponsored by SCOSTEP (Scientific Committee on Solar-Terrestrial Physics) established with an aim of significantly enhancing our understanding of the space environment and its impacts on life and society [<http://www.bu.edu/cawses/>]. The main functions of CAWSES are three-fold: [1.] to help coordinate international activities in observations, modelling, and applications crucial to achieving this understanding, [2.] to involve scientists in both developed and developing countries, and [3.] to provide educational opportunities for students of all levels.

Similarities are also present in regard to other activities such as the International Space Weather Initiative (ISWI) [ <http://www.iswi-secretariat.org/> ] where the objective is to develop the scientific insight necessary to understand the science, and to forecast near-Earth space weather using the following tools: [1.] Instrumentation and data analysis, [2.] Coordinate data products to provide input for physical modeling, [3.] Coordinate data products to allow predictive relationships to be developed.

Indeed, we should be careful that we do not replicate ongoing efforts, but instead it should be ensured that we complement them instead.

## **6. SOTERIA (Giovanni Lapenta)**

Giovanni Lapenta gave an overview about the FP7 Solar-Terrestrial Investigations and Archives (SOTERIA) project. The SOTERIA document repository is located on the European Space Weather Portal at <http://www.spaceweather.eu/en/soteria> . For more information about SOTERIA see <http://soteria-space.eu/> .

## **7. EPT Day (Mathias Cyamukungu)**

Mathias Cyamukungu gave a presentation about the Energetic Particle Telescope (EPT) Day held in Louvain-la-Neuve on 4 June 2010. The EPT day provided potential users with an opportunity to in-beam operate the Engineering Model (EM) and note the instrument performances. Moreover, keynote speakers delivered seminars on science-class space instruments requirements, possible EPT applications and other supporting

activities. For more information about the EPT day see [http://csrsrv1.fynu.ucl.ac.be/csr\\_web/ept/eptday.php](http://csrsrv1.fynu.ucl.ac.be/csr_web/ept/eptday.php).

## 8. SWWT Terms of Reference

*AI SB 2009-1/3: NC, MH and AG to propose updated terms of reference at next SWWT meeting. [DONE]*

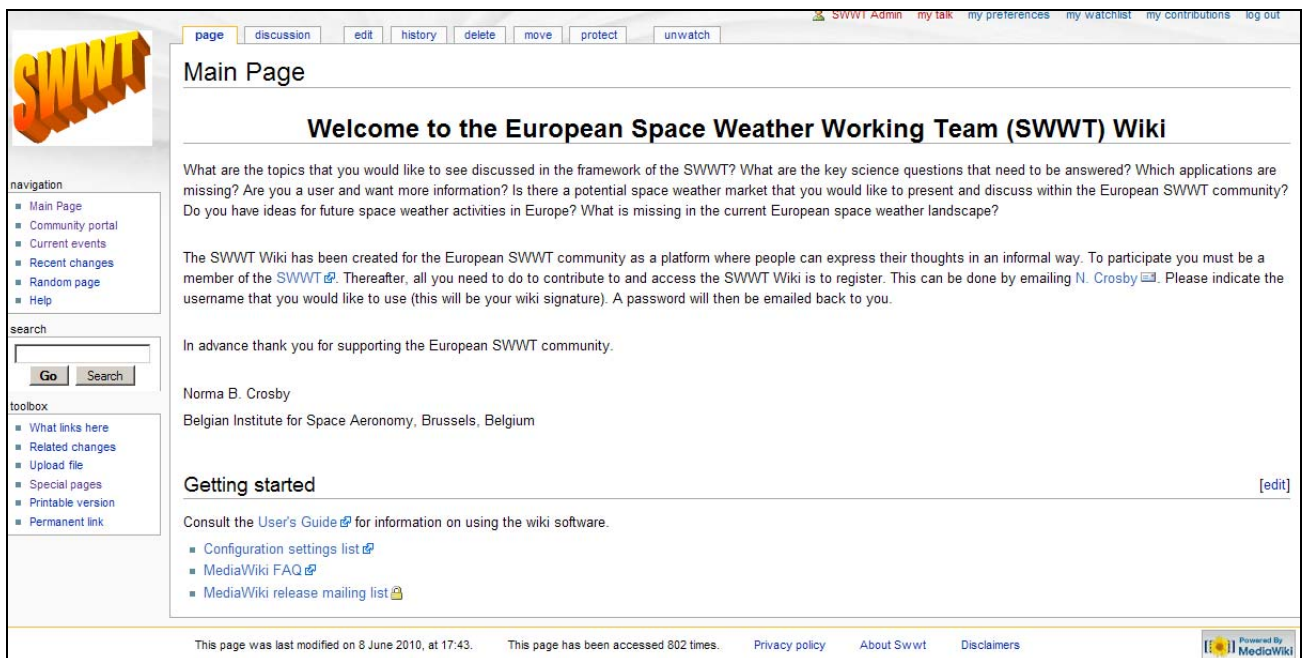
Following the SWWT Steering Board meeting it was agreed that an update is necessary as the SWWT has reached a third phase with the start of the Space Situational Awareness (SSA) programme. Discussion is ongoing as to the scope of the SWWT mandate taking into account recent evolutions in the European landscape, and also how the Steering Board could be constituted to best facilitate the work of the SWWT.

## 9. SWWT Wiki

*AI SB 2009-2/6: SWWT Blog (or something similar) to be developed for the SWWT community (NC to organise). [DONE]*

The SWWT wiki [ <http://swwt.aeronomie.be> ] is being hosted by the Belgian Institute for Space Aeronomy and has been created for the European SWWT community as a platform where people can express their thoughts in an informal way. It was launched on 29 March 2010.

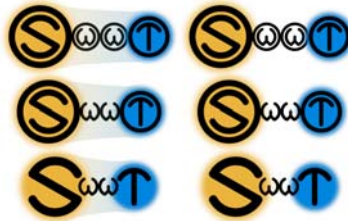
NC emphasised that input from the community is very important for the output of the SWWT roadmap activity (see Item 10).



The screenshot shows the main page of the SWWT Wiki. At the top, there is a navigation bar with links for 'page', 'discussion', 'edit', 'history', 'delete', 'move', 'protect', and 'unwatch'. The page title is 'Main Page'. Below the title, there is a large heading: 'Welcome to the European Space Weather Working Team (SWWT) Wiki'. The main content area contains several paragraphs of text, including a welcome message and information about the wiki's purpose and how to contribute. There is also a 'Getting started' section with links to the User's Guide, Configuration settings list, MediaWiki FAQ, and MediaWiki release mailing list. The page footer includes a timestamp, access count, and links for 'Privacy policy', 'About Swwt', and 'Disclaimers'. A 'Powered By MediaWiki' logo is visible in the bottom right corner.

In parallel, the SWWT logo contest was launched. For the current SWWT Plenary two SWWT logo suggestions had been received:

- From Jens Rodmann: He suggested that the logo be inspired by the drawings from the “I Love My Sun” event.
- From Juan Cabrera:



Additional comments and suggestions are welcome. The final logo will be presented during the European Space Weather Week in November.

## 10. SWWT Roadmap

NC has initiated a Roadmap Activity within SWWT.

NC gave a presentation about the SWWT roadmap activities including a draft Table of Contents. This document will represent community inputs, will be a live document and will consequently be updated as a function of developments in the community. A first release and set of recommendations is expected in conjunction with the SWWT meeting in mid 2011.

The document will especially cover the rationale behind embarking on a long-term European space weather roadmap activity (>10, 20 years), taking into account all expected key players and addressing the current and future critical elements and user community (/communities). For example, the European Galileo programme is expected to be one future user that will influence the direction of European space weather activities on these timescales.

During the SWWT Steering Board meeting it was suggested that the SWWT wiki also be used as a document repository.

## **PART 2 – Technical Discussion: Space Weather Metrics Presentation + Discussion Presentation: Ioanna Tzagouri**

Ioanna Tzagouri gave the presentation “Current practice for the assessment of the performance of space weather models with metrics”. The work presented is part of a study being performed under the COST ES0803 Action [See PART 3 – Item 4]. One of



the main tasks to be coordinated by the Action is the assessment of existing space weather research and operational models. The assessment requires the development of criteria and metrics which can objectively be applied to judge the performance of the models.

Following the presentation there was a lot of discussion among the participants and many questions were posed:

- Which models are the most useful?
- Which scenarios should one test (5 min, 1 min grid)?
- What parameter(s) to use (to compare)?
- How should the models be provided? Should the testing be performed on one specific server? If yes, how then is the safest way to transfer the data?
- Can we learn from the experience that the meteorological community has already gained in this exercise?

It was suggested that results from the COST metrics activity may form the basis for recommendations from the SWWT community to the ESA SSA programme.

*AI M27/1: Ioanna Tsagouri, Anna Belehaki, Alexi Glover, Sean Bruinsma, Daniel Heynderickx, Jens Rodmann and Norma Crosby to write up a resumé concerning the main outcomes of this discussion.*

## **PART 3 – PRESENTATIONS**

### **1. SSA (Alexi Glover)**

Alexi Glover gave a status report about the ongoing Space Situational Awareness (SSA) space weather activities. The ESA SSA now has a formal website:  
<http://www.esa.int/ssa>

Two new member states (Luxembourg and Finland) have recently joined the SSA programme.

It was confirmed by Jens Rodmann that it is still possible to send information about national space weather assets to ESA.

### **2. ESA R&D (Jens Rodmann)**

Jens Rodmann (JR) gave the presentation “New ESA R&D activities on space environments and effects”. Specifically, he identified the differences between the different R&D programmes:

- General Studies Programme (GSP)
- Technology Research Programme (TRP)
- General Support Technology Programme (GSTP)

Several additional GSTP5 proposals relevant to the Space Situational Awareness programme will be submitted to Member States for funding in September 2010.

### **3. FP7 / FP8 - the Way Forward (Mike Hapgood sent slides)**

Mike Hapgood (MH) was not able to attend the SWWT Plenary and sent a presentation. On behalf of MH, NC gave his presentation.

The presentation emphasised the importance of looking forward – lobbying now for extended coverage of space weather for example in FP8. Geomagnetically Induced Currents (GIC) and Global Navigation Satellite Systems (GNSS) are strong cases where space weather can be identified as a potential risk to civil security.

### **4. COST ES0803 (Anna Belehaki)**

Anna Belehaki gave an update on the COST ES0803 Action “Developing Space Weather Products and Services in Europe”. Three main areas of activity are included in this COST Action:

- The assessment and validation of space weather models for research and applications
- The specification of recommended space weather products and services
- The exploitation, dissemination, education, and outreach programme.

For more information about this COST Action see: <http://www.costes0803.noa.gr/> .

### **5. HELIO + CASSIS (Bob Bentley sent slides)**

Bob Bentley (BB) was not able to attend the meeting and sent a detailed presentation concerning HELIO and CASSIS. On behalf of BB, AG gave his presentation:

- The Heliophysics Integrated Observatory (HELIO) is a Research Infrastructure funded under EC’s FP7 Capacities Specific Programme. HELIO started 1 June 2009 with a duration of 36 months. For more details see <http://www.helio-vo.eu> .
- The Coordination Action for the integration of Solar System Infrastructures and Science (CASSIS) is a Coordination Action funded under Research Infrastructures within the Capacities programme of FP7. CASSIS started 1 June 2010 with a duration of 36 months. For more information see <http://www.cassis-vo.eu> .

### **6. NATO SSA (Frank Jansen sent slides)**

Frank Jansen (FJ) was not able to attend the meeting and sent the presentation “NATO Operations and Space Situational Awareness: A Study by the RTO/SCI-229 Exploratory Team”. On behalf of FJ, NC gave his presentation.

## **7. US/FEMA-EU/MSB (Henrik Lundstedt sent slides)**

Henrik Lundstedt (HL) was not able to attend the meeting and sent the presentation “US/FEMA-EU/MSB collaboration on managing critical space weather disasters”. On behalf of HL, AG gave his presentation.

In February this year the United States (U.S.) Federal Emergency Management Agency (FEMA), the Swedish Civil Contingencies Agency (MSB), and the U.S. National Oceanic and Atmospheric Administration (NOAA) planned and hosted “The Workshop on Managing Critical Disasters in the Transatlantic Domain – The Case of a Geomagnetic Storm” in Boulder, Colorado. The workshop strengthened transatlantic emergency management ties and increased awareness among both U.S. and EU stakeholders of the dangers posed by severe space weather.

## **8. WMO (Alain Hilgers sent slides)**

Alain Hilgers (AH) was not able to attend the meeting and sent the presentation “Update on the potential role of World Meteorological Organisation in Space Weather”. On behalf of AH, AG gave his presentation. The Commission for Basic Systems at its 14th session in March 2009 decided to establish an Inter-programme Coordination Team on Space Weather (ICTSW) involving space weather experts. The team as now been constituted and is co-chaired by Dr Xiaoxin Zhang (Space Weather Prediction Centre of CMA) and Dr Terry Onsager (NOAA/SWPC). The group held a kick-off meeting earlier this year and is currently working on Terms of Reference and a workplan.

The World Meteorological Organisation (WMO) supports international coordination of space weather activities acknowledging the potential synergy between meteorological and space weather services:

<http://www.wmo.int/pages/prog/sat/SpaceWeather.html> .

## **9. Any Other Business**

On behalf of Larisa Trichtchenko from Natural Resources Canada, Canada, NC advertised the “7th Canadian Solar Workshop” to be held in “La Petite Rouge”, Canada from 15 to 18 October 2010. “La Petite Rouge” is a resort in Quebec [2 hours to drive from Montreal or 2 hours to drive from Ottawa]. The reason for the location is very simple: it is equidistant from the “Forecast Centre” in Ottawa and from Université de Montreal where most solar physics resides. The meeting is held on a regular basis to better coordinate efforts in developing forecast models. For more information and if you would like to attend the workshop, please contact Larisa Trichtchenko at the following email address [ Larisa.Trichtchenko AT NRCan-RNCan.gc.ca ] .

Meeting closed at 17:30.

ANNEX

Space Weather Working Team  
Plenary Meeting 27

Friday, June 18, 2010, 09:30-17:00

Room "la salle méridienne"

Royal Observatory of Belgium, Brussels, Belgium

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Space Weather Working Team  
Plenary Meeting 27

Friday, June 18, 2010, 09:30-17:00

Room "la salle méridienne"  
Royal Observatory of Belgium, Brussels, Belgium

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