

SPACE WEATHER PRODUCT PORTAL **New candidate products**

(Submitted by Jan Janssens)

Summary and Purpose of Document

The WMO Space Weather Product portal offers near-real time access to a selection of space weather information products that are routinely generated by a range of space weather centres worldwide participating in the WMO ICTSW.

In this context, products can be further fine-tuned, or new products can be proposed. This document introduces two new products proposed respectively by the SIDC and by RMI/STCE, in Belgium.

- Graphs on the evolution and prediction of the ongoing sunspot cycle
- Nowcast graphs concerning geomagnetic activity as determined by the observatory in Dourbes (Belgium).

These products would constitute a valuable addition to the existing products on the WMO Space Weather Product portal.

ACTION PROPOSED

The Inter-Programme Coordination Team is invited to screen the proposals and formulate comments. Belgium will then implement the changes and create the necessary links and pages to get the products operational on the WMO SW Portal webpage.

- APPENDICES**
- A. Sunspot Cycle Page product summary
 - B. K-Logic product summary

DISCUSSION

1. INTRODUCTION

1.1 Background

The WMO Space Weather Portal hosts a variety of products that are useful for the Space Weather community, end users and other interested parties. It offers coordinated, well documented and up-to-date Space Weather information by means of selected and harmonized products. The products can be found at http://www.wmo.int/pages/prog/sat/spaceweather-productportal_en.php. There are currently more than 40 products, and they are distributed over 4 categories: Ionospheric, Geomagnetic, Energetic particles, and Solar & Interplanetary.

As our knowledge on solar activity and space weather grows, other or better performing/suited products may be developed.

A call to the members of the WMO ICTSW was sent on 2 October 2013 requesting comments on the existing products and proposal of new products. In response to the above cited invitation, two new products were proposed, one by the Solar Influences Data analysis Centre (SIDC) of the Royal Observatory of Belgium (ROB) and the other by the Royal Meteorological Institute of Belgium (RMI) and the ROB within the framework of the Solar-Terrestrial Centre of Excellence (STCE).

1.2 Scope of the document

This document provides a brief description of the two proposed products, for evaluation, and seeks the endorsement of ICTSW to proceed with the implementation of these products

2. PROPOSED NEW PRODUCTS

2.1 Sunspot cycle page

An important task of the SIDC (See: <http://www.sidc.oma.be/>) is to provide the official sunspot number. This parameter is worldwide used in many research projects and is for the profit of the entire space weather community. As such, the SIDC has created a "SILSO" page (Sunspot Index and Long-term Solar Observations) with the evolution and prediction of the current solar cycle, comparisons with previous sunspot cycles, as well as derived products such as the butterfly diagram or hemispheric sunspot numbers: <http://www.sidc.be/silso/>.

The information contained in this SILSO webpage constitutes a supplement to and expansion of the existing products in the category "Solar & Interplanetary". See details in Appendix A.

2.2 K-Logic

This product is proposed in the "Geomagnetic" category. It provides an hourly estimation (real-time) of the geomagnetic activity K-index in Dourbes, Belgium. As such, it is of potential use for all users affected by geomagnetic activity, in particular in Europe. The product was developed by RMI and ROB within the framework of the STCE. Because of the 1-hour output, it gives a much faster idea on the geomagnetic evolution than the typical indices.

The product is already available on line. It constitutes a supplement to and improvement of the existing products in the category "Geomagnetic". See details in Appendix B.

3. CONCLUSION

The proposed products would constitute valuable additions to the existing WMO Space Weather Portal. Therefore, pending a review of the proposals and an evaluation that they adhere to the structure and operating principles required for new products, it is recommended to accept both products.

The representatives of Belgium within ICTSW, in coordination with the Space Weather Portal IT managers, will then implement them into the WMO Space Weather Portal.

SUNSPOT CYCLE PAGE PRODUCT SUMMARY**Category:** Solar Cycle

Product name	Sunspot Cycle Page
Product description	Time-series plots of the sunspot cycle: past and predicted sunspot number, overview of past solar cycles, butterfly diagram, hemispheric sunspot numbers.
Target users	Long-term planning for the overall space weather community (satellites, radio communication, electric power industry,...); solar research.
Keywords	Sunspot cycle, sunspot number, butterfly diagram
Originating centre with link	ROB (Belgium): http://sidc.oma.be
Spatial area covered	N/A
Link to the product	http://www.sidc.be/silso/ssngraphics (existing page)
Format	Graphics
Data sources used for generating the product	http://www.sidc.be/silso/datafiles ; Sunspot group positions are taken from Locarno drawings.
Product generation method / Cadence	Web-based; Monthly
Operational status	Operational
Date stamp and POC for the product description	Product description : http://www.sidc.be/silso/ Frédéric Clette (frederic.clette@oma.be)
Validation information	Validation information available at POC product description
Quality indication	N/A

A page will be created by SIDC for this product collection, tentatively at the following URL:
<http://sidc.oma.be/WMO/SolarCycle.php> (URL still to be confirmed).

Outlook of the product collection page (to be created):

Solar Cycle

Sunspot Cycle Page

Product description: Time-series plots of the sunspot cycle: past and predicted sunspot number, overview of past solar cycles, butterfly diagram, hemispheric sunspot numbers.

Target users: Longterm planning for the overall space weather community (satellites, radio communication, electronic power industry,...); solar research

Data Source: <http://www.sidc.be/silso/datafiles>

Status: Operational

Link to: [Sunspot Cycle Page \(SILSO\)](#)

Outlook of the Sunspot Cycle Page – SILSO (existing)

Sunspot Number graphics

Home Data FAQ Observers Contact

Menu

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Daily, monthly and 13-month smoothed sunspot numbers for the past 13 years, and 12-month ahead predictions.

Monthly and 13-month smoothed sunspot numbers over the last 6 cycles.

Kalman filter improvement of the 12-month ahead Sunspot Number prediction by the standard curves method (SM) and by the Combined method (CM).

North and South hemispheric sunspot numbers (13-month smoothed values) over the last 6 cycles.

Yearly mean and 13-month smoothed monthly sunspot number since 1700.

Kalman filter improvement of the Maunder "butterfly" diagram, based

K-LOGIC PRODUCT SUMMARY**Category:** Geomagnetic activity

Product name	K-LOGIC
Product description	Hourly K-indices from Dourbes, with review up to the past 3 days. K-LOGIC is a nowcast system for operational real-time estimation of the geomagnetic activity index K in Dourbes, Belgium, and is also able to alert users for ongoing strong geomagnetic storm conditions.
Target users	All users affected by geomagnetic activity, especially in Europe
Keywords	Geomagnetism, K-index, nowcast, alert
Originating centre with link	Solar-Terrestrial Centre of Excellence (STCE), Belgium http://www.stce.be/ Royal Meteorological Institute (RMI), Belgium, http://www.meteo.be/meteo/view/en/65239-Home.html Royal Observatory of Belgium (ROB) http://www.astro.oma.be/
Spatial area covered	Belgium, Europe
Link to the product	http://gpsweather.meteo.be/geomagnetism/ground_K_dourbes
Format	Graphics, Data (ASCII) time series
Data sources used for generating the product	Ground-based magnetometer at RMI Geophysical Centre in Dourbes (Belgium)
Product generation method / Cadence	Web-based; Hourly
Operational status	Operational
Date stamp and POC for the product description	Product Description: http://ionosphere.meteo.be/geomagnetism Contact: Stan Stankov (S.Stankov@meteo.be)
Validation information	Validation information available at POC product description
Quality indication	The average r.m.s. error is smaller than 1 K unit. Reference: Stankov, S.M., Stegen, K., Warnant, R., K-type geomagnetic index nowcast with data quality control, Annals of Geophysics, 54(3), 285-295, 2011.

A page will be created by STCE for this product collection, tentatively at the following URL:
<http://stce.oma.be/WMO/Geomagnetism.php> (URL still to be confirmed)

Outlook of the product collection page (to be created):

Solar-Terrestrial Centre of Excellence

Geomagnetic Activity

K-LOGIC

Area: Belgium, Europe
Cadence: Hourly

Product description: Hourly K indices from Dourbes, with review up to the past 3 days. K-LOGIC is a nowcast system for operational real-time estimation of the geomagnetic activity index K in Dourbes, Belgium, and is also able to alert users for ongoing strong geomagnetic storm conditions.

Target users: All users affected by geomagnetic activity, especially in Europe.

Data source: Ground based magnetometers in Dourbes (Belgium)

Status: Operational

I link to: [K-LOGIC nowcast page](#)

Outlook of the K-LOGIC nowcast page (existing)

Solar-Terr. Centre of Excellence
Space Weather And Navigation Systems (SWANS)

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K index (ground)

Local K index at Dourbes (50.1°N, 4.6°E)
(ground-based measurements)

Data and products

- GNSS services
- Space Weather services
- k index nowcast (Dourbes):**
- SWAN
- Ionospheric Electron Density Profiles
- Ionospheric Slab Thickness
- Total Electron Content