

Brussels Trip Report

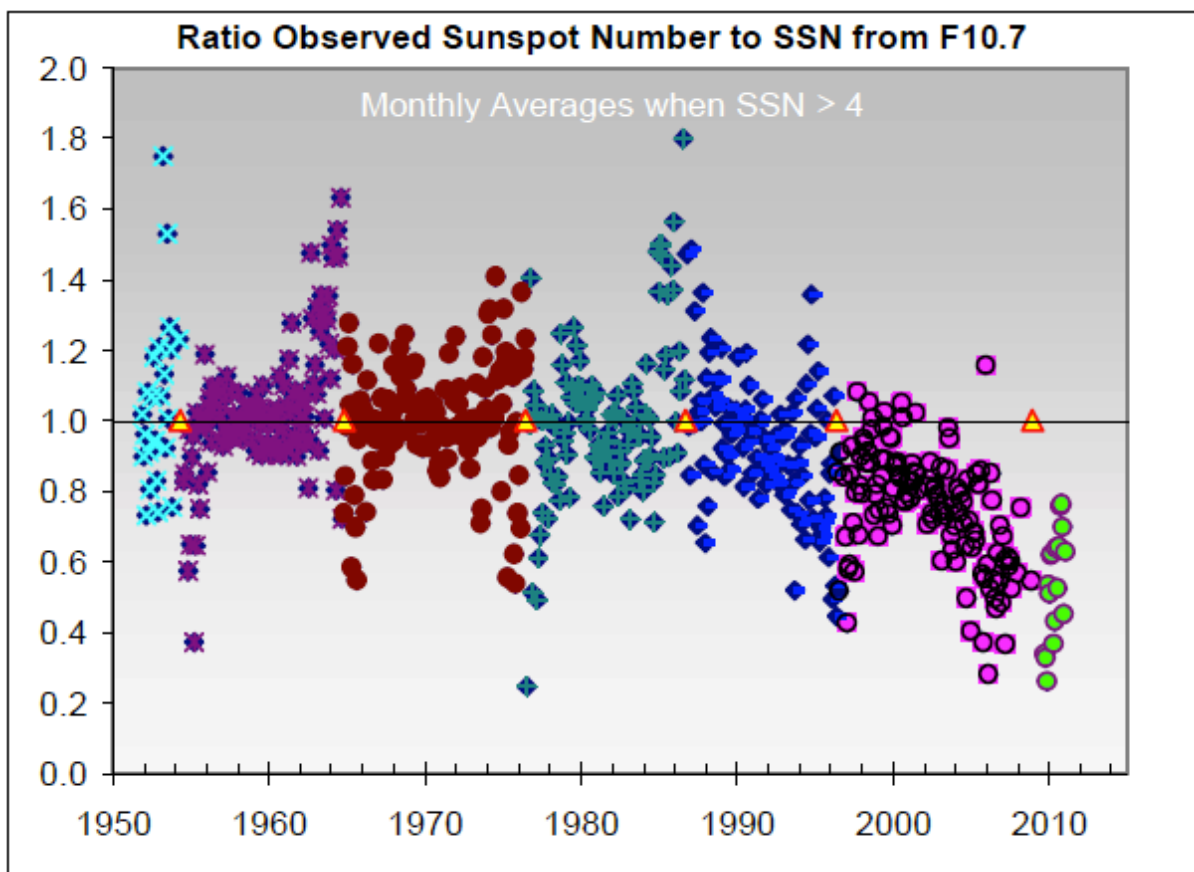
For AAVSO by R. Howe 01/6/2012.

Held at SIDC, Royal Observatory of Belgium, Brussels, 21 - 25 May 2012

The Brussels SSN workshop was sponsored by the Royal Observatory of Belgium (ROB), the National Solar Observatory (NSO), and the Air Force Research Laboratory (AFRL). While the first workshop, September, 2011 at Sunspot New Mexico offered a panorama of all issues in the sunspot number series, the Brussels workshop focused on the progress and additional evidence addressing the key problems of understanding solar indices as identified in the first workshop. Invited were additional European experts in the field of long-term tracers of solar activity. The goal was to make a synthesis of archival data and progress of defining solar indices in order to define an update the action list in view of the next workshop, which will be in January 2013, Tuscon Arizona.

General observations

The Agenda for the Brussels meeting is at the bottom of this report. I think the most talked about graph at the Brussels meeting was this one from Livingston & Penn (2006):



This Livingston & Penn graph comes from this article:

http://wattsupwiththat.files.wordpress.com/2008/06/livingston-penn_sunspots2.pdf

Meaning of the Workshop

Publically, there is a need to speak authoritatively about the SSN over historical times

- Definition and calibration of SSN, (like the compass needle magnetometers)
- Gratitude to SIDC (and AAVSO, and Sonne et al) for bringing the current SSN to perfection.

Livingston-Penn effect

- There was no question that something is happening which we have not seen before
 - We should try to understand this, and exploit it
 - We should ignore wild-sounding claims about sunspots disappearing completely
- However, the data are weak, and the theory is weaker
- We don't really understand the physical origin of any of our best indices (SSN and F10.7), especially across wide dynamic ranges of activity
- It is even worse for less-well-understood items such as the Mount Wilson Observatory plage or Ca K indices (cf. IRIS improvements)

At any rate, there was much speculation, which is summarized here:

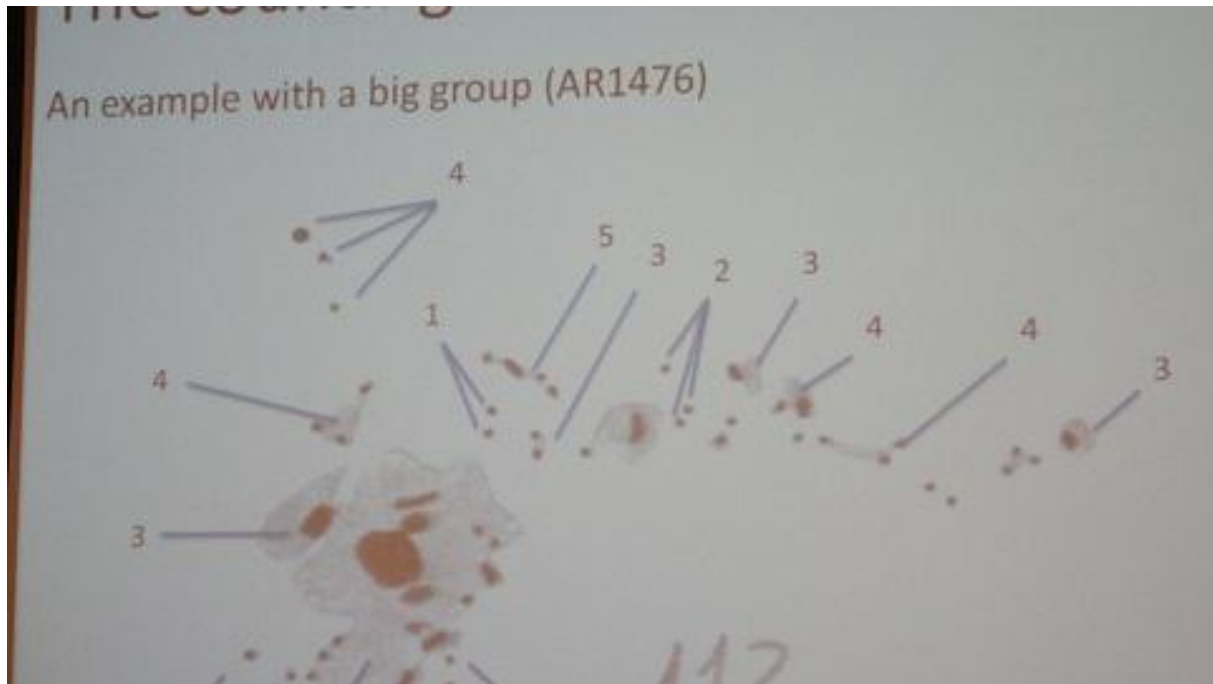
<http://www.leif.org/research/SSN/Hudson.pdf>

Ad hoc requests for AAVSO sunspot data sets

I have sent the AAVSO raw sunspot data (201005 to 201204) to Jamie Riggs, University of Northern Colorado, Thomas Rhoades, University of California, Thierry Dudok de Wit, Universite d'Orleans in France, and Ali Kilcik, Big Bear Observatory in California, (New Jersey Institute of Technology). All of these folks except for Thierry have publications (some pending). I can't say how many folks have used the NOAA/NGDC archive monthly data for research.

Folks who have shown interest in the AAVSO Ra Number, at least from the Brussels meeting, are Hugh Hudson from Berkeley, David Willis from RGO, UK, Frederic Clette, and Laure Lefevre from ROB, BE. These folks are perhaps more interested in how we calculate the Ra number, rather than using our data. But, it's too early to tell who from the meeting who may have an interest.

Discussions on how to count sunspots and sunspot groups



Many talks were on how past and present observatories count sunspots and sunspot groups. Much of the archived data are of drawings and logs kept in university and observatory libraries. These need to be digitized and made available as has been done by the Royal Greenwich Observatory. There were questions about AAVSO's current method for calculating the American Relative number. To some extent statistical processing for sunspot numbers is new. The AAVSO Ra has only been adjusted once during the mid-1990s mainly to correct for what was believed to be inflation in the yearly estimates of Observer's K factors. Now, looking back with a 15 year perspective, we can see that correcting for the AAVSO Ra number has been shown to match the SIDC international index. However, the inflation problem implies a vulnerability of the Ra index as it still rests mainly on yearly updates to Observer K factors.

Agenda

MONDAY 21/5

13:00 - 14:00: Registration

13:00 - 14:00: lunch (possible at the ROB cafeteria)

14:00 - 14:15: Welcoming remarks: Frédéric Clette & Ronald Van der Linden (ROB Director)

14:15 - 14:30: Motivations and goals: Ed Cliver

Introduction to the SSN (Chair E. Cliver)

14:30 - 15:10: T. Friedli: Rudolf Wolf and the Zürich Sunspot Number

15:10 - 15:50: F. Clette: The international Sunspot Index: method and relation with recent indices

15:50 - 16:00: break

16:00 - 16:30: L.Svalgaard (K. Schatten): The Group Sunspot Number

16:30 - 16:45: Discussion: questions and clarifications regarding the methods at the base of the SSN.

16:45 – 18:00: Welcome Reception at the ROB

TUESDAY 22/5

Introduction to the SSN (Chair F. Clette)

08:30 – 09:00: M. Cagnotti & Gatti: Sunspot Number at the Specola Solare Ticinese Locarno: past and present

09:00 – 09:20: L. Svalgaard: Study of the weighted sunspot count at Locarno

09:20 – 09:40: W. Poetzi: Sunspot observations at the Kanzelhöhe Observatory

09:40 – 10:00: Discussion: questions and clarifications about the practices at Locarno

Sunspot & facular areas (Chair: A.Pevtsov)

10:00 – 10:30: D. Willis: The Greenwich Photo-heliographic Results, 1874 - 1976.

10:30 – 10:50: A. Tlatov & V. Erschov: Numerical processing of sunspot images using the digitized Royal Greenwich Observatory Archive

10:50 - 11:10: break

11:10 – 11:30: P. Foukal (teleconf): title TBD

11:30 – 11:50: A. Pevtsov: title TDB

11:50 – 12:10: A. Tlatov, D.Lepshokov & V. Vasil'eva: Reconstruction of the characteristics of sunspots in the period 1853-1879

12:10 – 12:30: M. Laurenza, The Empirical Mode Decomposition to study the sunspot number variability.

12:30 -12:50: Discussion: about developing standards for measuring sunspot areas.

13:00 - 14:00: lunch

Recent sunspot activity and the fading of sunspots (Chair: A. Pevtsov)

14:00 – 14:20: Alexei Pevtsov: Sunspot Magnetic Fields and umbral areas in Cycles 15-19

14:20 – 14:40: H. Hudson (F. Watson): A first systematic look at sunspot statistics from space

14:40 – 15:00: L. Lefèvre & F. Clette: Are the sunspots vanishing ? What was different in solar cycle 23 ?

15:00 – 15:30: G. de Toma: Sunspot variations over two solar cycles

15:30 - 15:45: break

15:45 – 16:05 [20m]: M. Penn (teleconf) : Changing Distribution of Umbral IR Magnetic Field Strengths and Application to F10.7

16:05 – 16:30: Discussion: Cycle 23 anomalies and lessons for the past sunspot record.

The American Sunspot Number (Chair: F. Clette)

16:30 – 17:10: R. Howe & J. Riggs: The American Sunspot Number from the AAVSO

17:10 – 17:20: F. Clette: A 70-year long comparison of Ra and Ri

17:20 -- 17:40: Discussion: Questions regarding the counting and processing methods

WEDNESDAY 23/5

AM: Discovery of Brussels: group sightseeing tours

PM: Free afternoon, Split meetings (science or technical)

THURSDAY 24/5

Using geomagnetic indices to calibrate or validate the SSN (Chair: E. Cliver)

08:30 - 09:10: L. Svalgaard: Using the daily range of geomagnetic activity as a consistency check on the ISN

09:10 - 09:40: I. Cnossen: The effects of secular change in the Earth's internal magnetic field on geomagnetic activity

09:40 - 10:20: K. Mursula: title TBD

10:20 - 10:40: Discussion: on the use of geomagnetic proxies

10:40 - 11:00: break

Using Cosmic Rays to Justify the Consistency of the SSN (Chair: I. Usoskin)

11:00 – 11:40: I. Usoskin: title TBD

11:40 – 12:00: Discussion: on the use of isotope proxies

Reconciling the International and Group SSNs (Part 1) (Chair: F. Clette)

12:00 – 12:40: J. Vaquero: Sunspot data from 17th-19th centuries

12:40 – 13:00: D. Willis & M. Wild: Reconciling the International and Group Sunspot Numbers: Evidence from the Greenwich Photo-heliographic Results.

13:00 - 14:00: lunch

Reconciling the International and Group SSNs (Part 2) (Chair: F. Clette)

14:00 – 14:40: R. Arlt: Sunspots observations before 1900 in their originals

14:40 – 15:00: F. Clette & L. Wauters: Reconstructed Group SSN over the last 40 years: some insights

15:00 – 15:20: I. Usoskin: Computation of clean Wolf and group numbers from Schwabe's originals

15:20 - 15:40: break

15:40 – 16:10: L.Svalgaard: Rectifying the GSN and ISN after 1826

16:10 – 16:30: Discussion: on remaining issues in the SSN and group SSN

19:00: Workshop banquet in downtown Brussels.

FRIDAY 25/5

Ca II-K line index & other Sunspot Number Proxies (Chair: L. Bertello)

09:00 – 09:30: L. Bertello: Consistency of Ca II K measurements at intermediate and long time scales. How well they agree with the ISN?

09:30 - 9:50: A. Pevtsov: title TBD

09:50 – 10:20: T. Dudok de Wit: title TBD

10:20 - 10:30: break

10:30 – 12:00: *Workshop Summary/Discussion & Mid-Course Assessment (Chair:E.Cliver)*

All participants + observers: R. Brajsa, H. Hudson, N. Crosby, G. De Toma

12:00 – 12:30: *Planning for the Third SSN Workshop (Chair: E.Cliver & F. Clette)*

12:30: end of the meeting

13:00 - 14:00: lunch (possible at the ROB cafeteria)

Social activities

Wednesday May 23 (AM): Sightseeing tour “Discover Brussels”

- A guided **walking tour** featuring the historical, architectural and cultural highlights of downtown Brussels (Duration: about 2 hours; Fee: about 5 euro TBC)

ROB staff members took everyone on the tour to conclude with an apero in a nice tavern near the Grand Place.

Thursday May 24 evening 19h00: workshop banquet at the “Cercle des Voyageurs” Location: “Le cercle des Voyageurs”, 18 rue des Grands Carmes, 1000 Bruxelles Web: <http://www.lecercledesvoyageurs.com>

This picturesque and popular restaurant is located in the heart of Brussels



Participants at the meeting

Rainer Arlt, Laura Balmaceda, Luca Bertello, Roman Brajsa, Marco Cagnotti, Frédéric Clette, Ed Cliver, Ingrid Clossen, Norma Crosby, Véronique Delouille, Gianna de Toma, Steven Dewitte, Thierry Dudok de Wit, Peter Foukal, Thomas Friedli, Mario Gatti, Samuel Gissot, Rodney Howe, Hugh Hudson, André Koeckelenbergh, Matthieu Kretschmar, Monica Laurenza, Laure Lefevre,, Kalevi Mursula, Matt Penn, Alexei Pevtsov, Werner Poetzi, Jamie Riggs, Leif Svalgaard, Andrey Tlatov, Ilya Usoskin, Ronald Van der Linden, Lidia Van Driel – Gesztelyi, José Vaquero, Laurence Wauters, David Willis

SSN workshop Web site

<http://ssnworkshop.wikia.com/wiki/Home>

On this site, you can find general information, the announcements and the presentations of the 1st SSN Workshop. All presentations of this 2nd Workshop will be added after the meeting. Leif is the curator for the website so please contact him with any questions or suggestions (leif@leif.org).

Conclusions

To remain in this ‘ball game’, so to speak, I think we only need to do what AAVSO has done in the past. In many ways we have become a ‘standard’ for being robust and long-standing with accurate monthly American Relative sunspot numbers. By taking an interest in the sunspot community of scientists, such as with these Sunspot Workshops, we should little by little see an increase in data usage and research related publications.