Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS
SOLAR SECTION

Rodney Howe, Editor, Chairperson
c/o AAVSO, 49 Bay State Rd
Cambridge, MA 02138

Web: http://www.aavso.org/solar-bulletin
Email: solar.aavso@gmail.com
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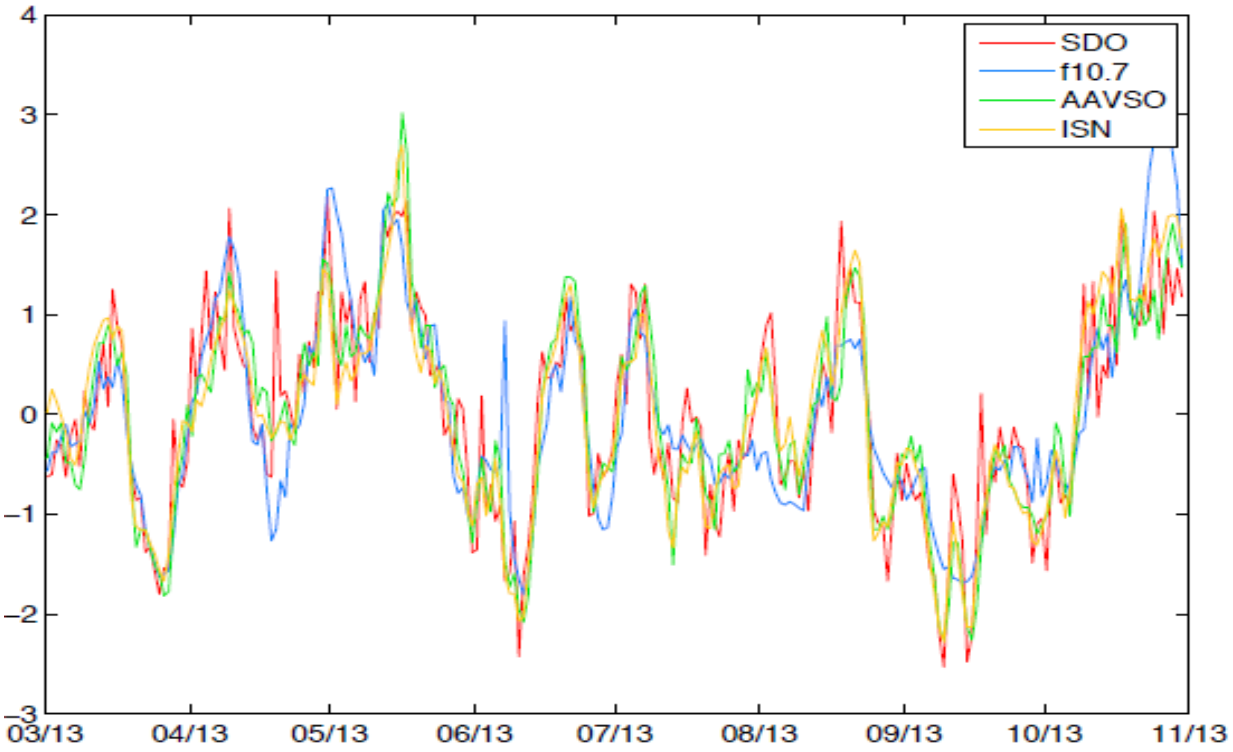
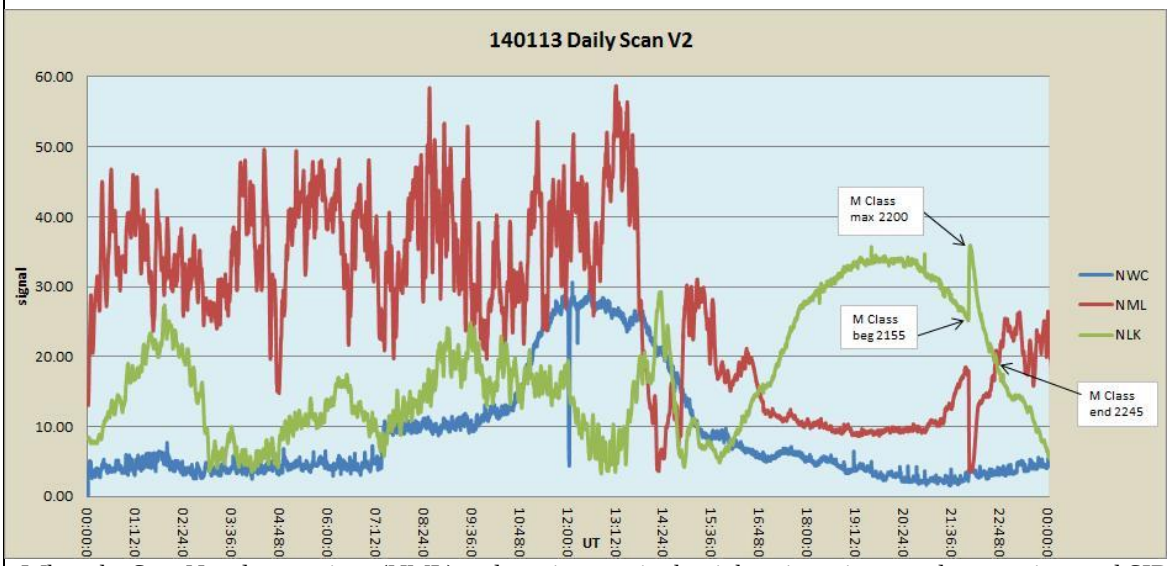


The graph above shows the Solar Dynamics Observatory (SDO) data http://www.nasa.gov/mission_pages/sdo/main/ with the SDO Wolf number (data in the SunEntry database), the AAVSO American Relative number (Ra) together with the Penticton 10.7 cm Solar Flux Unit (SFU) values for most of 2013. The NRC Penticton data (labeled f10.7) come from here: ftp://ftp.geolab.nrcan.gc.ca/data/solar_flux/daily_flux_values/fluxtable.txt and the International Sunspot Number (ISN) comes from the Solar Influences Data Center (SIDC) Royal Observatory, Belgium.http://sidc.oma.be/sunspot-index-graphics/sidc_graphics.php Graphs courtesy of Thierry Dudok de Wit (Laboratoire de Physique et Chimie de l'Environment et de l'Espace). There are more plots and explanation on the last page of this Solar Bulletin.

Sudden Ionospheric Disturbance Report



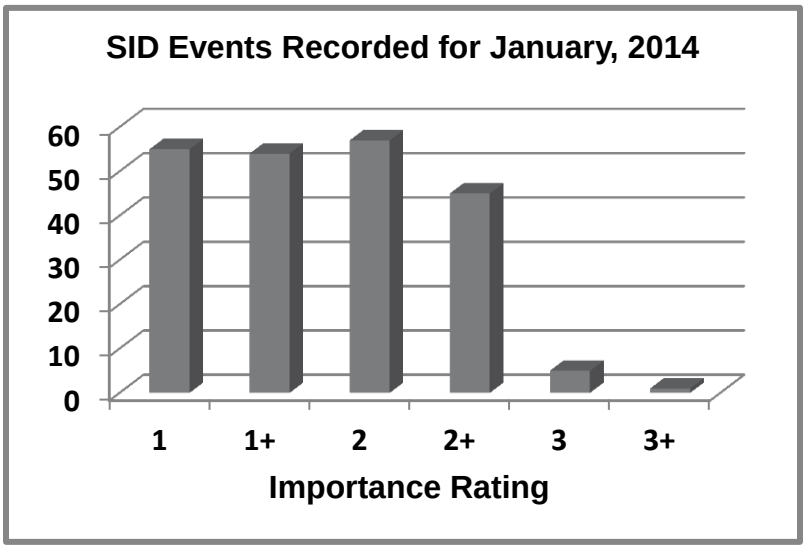
When the Sun, Naval transmitter (NML) and receiver are in the right orientation you detect an inverted SID.

Sudden Ionospheric Disturbances (SID) Records During January, 2014

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
140101	1546	1+	140104	1020	1+	140107	0703	2
140101	1847	2	140104	2142	1+	140107	0718	2
140101	2205	2	140104	0214	2	140107	1825	2
140101	1855	2+	140104	0244	2	140107	0745	2+
140102	0428	1+	140104	0632	2	140107	1043	2+
140102	1224	1+	140104	1028	2	140107	1500	2+
140102	2103	1+	140104	0604	2+	140107	0412	3
140102	2317	1+	140104	2231	2+	140108	0310	1+
140102	0157	2	140104	1925	3	140108	0159	2
140102	0220	2	140105	1543	1+	140108	0320	2
140102	0400	2	140105	0228	2+	140108	0345	2
140102	1157	2	140105	1120	2+	140108	1510	2
140102	2218	2	140106	0845	1+	140109	1616	1+
140102	0232	2+	140106	2247	1+	140109	1013	2
140102	1131	2+	140107	0314	1+	140109	1132	2
140103	0632	1+	140107	1014	1+	140109	1440	2+
140103	0817	1+	140107	1310	1+	140110	0647	1+
140103	1533	1+	140107	1417	1+	140110	1300	1+
140103	2222	1+	140107	1442	1+	140110	0718	2
140103	2324	1+	140107	2212	1+	140110	1110	2
140103	0358	2	140107	2231	1+	140110	2223	2
140103	0658	2	140107	0234	2	140111	0003	2
140103	1512	2	140107	0323	2	140111	1740	2
140103	0252	3	140107	0351	2	140111	0740	2+

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
140111	0928	2+	140118	0324	2	140128	0529	2
140111	1120	2+	140118	1530	2+	140128	0730	2
140111	2318	2+	140119	0657	1+	140128	2215	2
140112	2138	2	140119	0930	1+	140129	0335	1+
140112	0005	2+	140119	0548	2+	140129	2249	1+
140112	0206	2+	140119	1500	2+	140129	0712	2
140112	2126	2+	140120	0213	1+	140129	0422	2+
140113	1140	1+	140120	0222	2	140129	1442	2+
140113	2150	1+	140120	0236	2+	140129	0437	3
140113	1030	2	140121	0115	1+	140130	0314	1+
140113	0505	2+	140124	1400	2	140130	0638	1+
140114	0327	2+	140125	0550	2+	140130	0809	1+
140114	1040	2+	140126	0606	2+	140130	0440	2
140114	1500	2+	140126	0616	2+	140130	0803	2
140115	1415	1+	140127	0114	1+	140130	1603	2
140115	0945	3+	140127	2209	1+	140130	0250	2+
140116	0552	1+	140127	0207	2	140130	1059	2+
140116	1230	1+	140127	0416	2	140130	1611	2+
140116	0905	2+	140127	0504	2	140131	0005	1+
140116	1500	2+	140127	1950	2+	140131	0744	1+
140116	1524	2+	140127	2227	2+	140131	1119	1+
140117	1330	2	140128	0036	1+	140131	1315	1+
140117	0231	2+	140128	0310	1+	140131	0455	2
140117	0412	2+	140128	1940	1+	140131	0504	2
140117	1941	2+	140128	0405	2	140131	1015	2

Solar Events

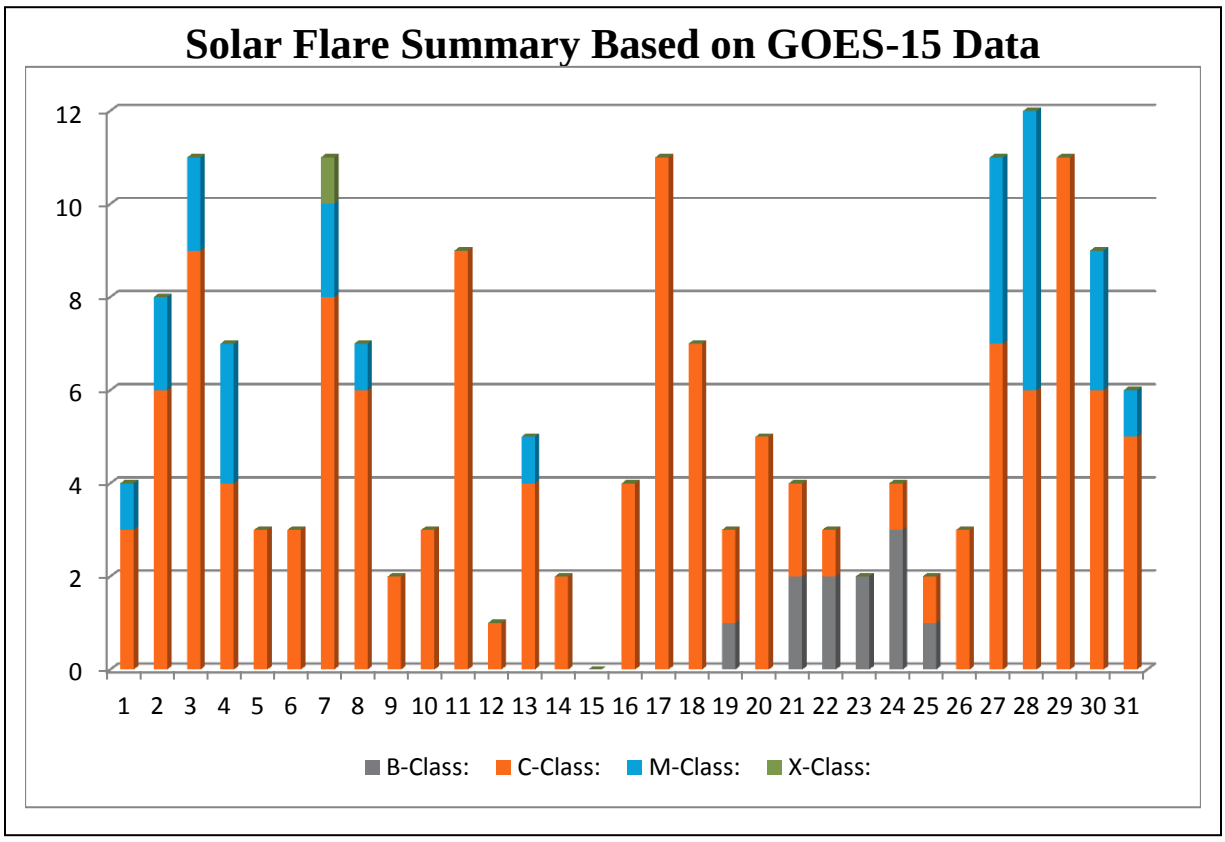


Importance rating: Duration (min)	1-: <19	1: 19-25	1+: 26-32	2: 33-45	2+: 46-85	3: 86-125	3+: >125

Sudden Ionospheric Disturbances (SID) Observers During January, 2014

Observer	Code	Station(s) monitored	Observer	Code	Station(s) monitored
A McWilliams	A94	NML	J Karlovsky	A131	DHO NSY
R Battaiola	A96	HWU	R Green	A134	JJI NWC
J Wallace	A97	NAA	R Mrllak	A136	GQD NSY
L Loudet	A118	DCF NAA TBB	D Koawl	A137	HWU NAA NML
B Terrill	A120	JJI NWC	S Aguirre	A138	NLK
F Adamson	A122	NWC	F Francione & C Re	A139	HWU NAA NSY
S Oatney	A125	NLK NML	L Corp	A140	DHO
K Cotar	A129	DHO	I Ryumshin	A142	DHO GQD HWU

There were 176 solar flares measured by GOES-15 for January, 2014, 1 X class, 26 M class, 135 C class and 11 B class flares. The slightly more active this month compared to last, with many M class flares. There were 16 AAVSO SID observers who submitted reports this month.



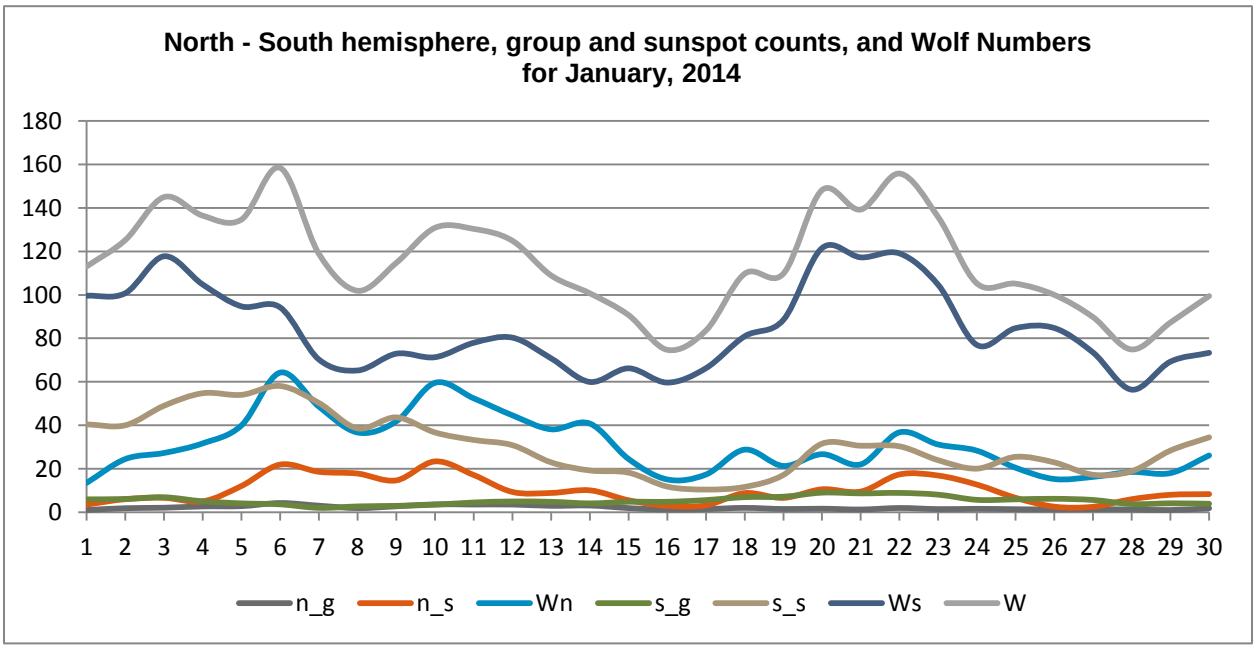
American Relative Sunspot Numbers (Ra) for January, 2014 [**boldface = maximum, minimum**]

DAY	NumObs	RAW	Ra
1	30	102	76
2	24	119	94
3	25	131	101
4	23	110	84
5	24	126	90
6	30	136	98
7	27	104	80
8	20	96	79
9	28	103	82
10	25	124	92
11	30	124	93
12	34	118	87
13	28	99	75
14	26	89	66
15	23	81	59
16	24	78	56
17	30	70	52
18	28	102	76
19	28	100	79
20	27	129	96
21	24	133	102
22	31	142	**107**
23	31	119	91
24	31	99	73
25	29	87	67
26	33	71	52
27	22	67	**46**
28	25	70	55
29	26	84	66
30	24	77	65
31	22	81	61
Average	**26.8**	**102.3**	**77.3**

Obs	#Obs	Name
AAP	1	A. Patrick Abbott
AAX	20	Alexandre Amorim
AJV	16	J. Alonso
ARAG	29	Gema Araujo
ASA	6	Salvador Aguirre
BARH	14	Howard Barnes
BATR	3	Roberto Battaiola
BDDA	18	Diego Bastiani
BERJ	9	Jose Alberto Berdejo
BMF	12	Michael Boschat
BRAB	25	Brenda Branchett
BRAF	7	Raffaello Braga
BRAM	1	Mark Bradbury
BROB	29	Robert Brown
BSAB	28	Santanu Basu
BXD	7	Alexandru Burda
CADA	1	Adair Cardoso
CFO	1	Jean F. Coliac
CHAG	26	German Morales Chavez
CIOA	12	Ioannis Chouinavas
CKB	16	Brian Cudnik
CLZ	1	Laurent Corp
CNT	10	Dean Chantiles
CVJ	1	Jose Carvajal
DGP	16	Gerald Dyck
DJOB	6	Jorge del Rosario
DUBF	19	Franky Dubois
FAM	4	Fabio Mariuzza
FERJ	10	Javier Ruiz Fernandez
FLET	24	Tom Fleming
FLF	20	Fredirico Luiz Funari
FTAA	11	Tadeusz Figiel
FUJK	23	K. Fujimori
HAYK	6	Kim Hay
HOWR	24	Rodney Howe
JGE	4	Gerardo Jimenez Lopez
JJMA	5	Jessica M.Johnson
KAND	14	Kandilli Observatory
KAPJ	21	John Kaplan
KNJS	25	James & Shirley Knight
KROL	18	Larry Krozel
LKR	6	Kristine Larsen
MARE	5	Enrico Mariani
MCE	28	Etsuiku Mochizuki
MGAA	3	Gael Mariani
MILJ	6	Jay Miller
MJHA	24	John McCammon
MMI	13	Michael Moeller
OATS	12	Susan Oatney
ONJ	8	John O'Neill
RICE	7	E. C. Richardson
RLM	4	Mat Raymonde
RRO	7	Ralph Rogge
SDOH	31	SDO - Jan Alvestad
SCGL	21	Gerd-Lutz Schott

SIMC	2	Clyde Simpson	WRP	7	Russell Wheeler
SONA	8	Andries Son			
STAB	26	Brian Gordon-States			
SUZM	27	Miyoshi Suzuki			
TESD	24	David Teske	**Total**	**Observers:**	**66**
URBP	12	Piotr Urbanski	**Total**	**Observations:**	**863**
VARG	16	A. Gonzalo Vargas			
VIDD	8	Daniel Vidican			
WAU	2	Artur Wargin			
WILW	13	William M. Wilson			

35 of our 66 observers submitted data on the sunspot and group counts for the Sun's north and south hemispheres. It is interesting to note how the Wolf numbers of group and sunspot counts do not cross over any day this month; the southern hemisphere is predominant.



Reporting Addresses:

Sunspot Reports – Kim Hay

solar.aavso@gmail.com

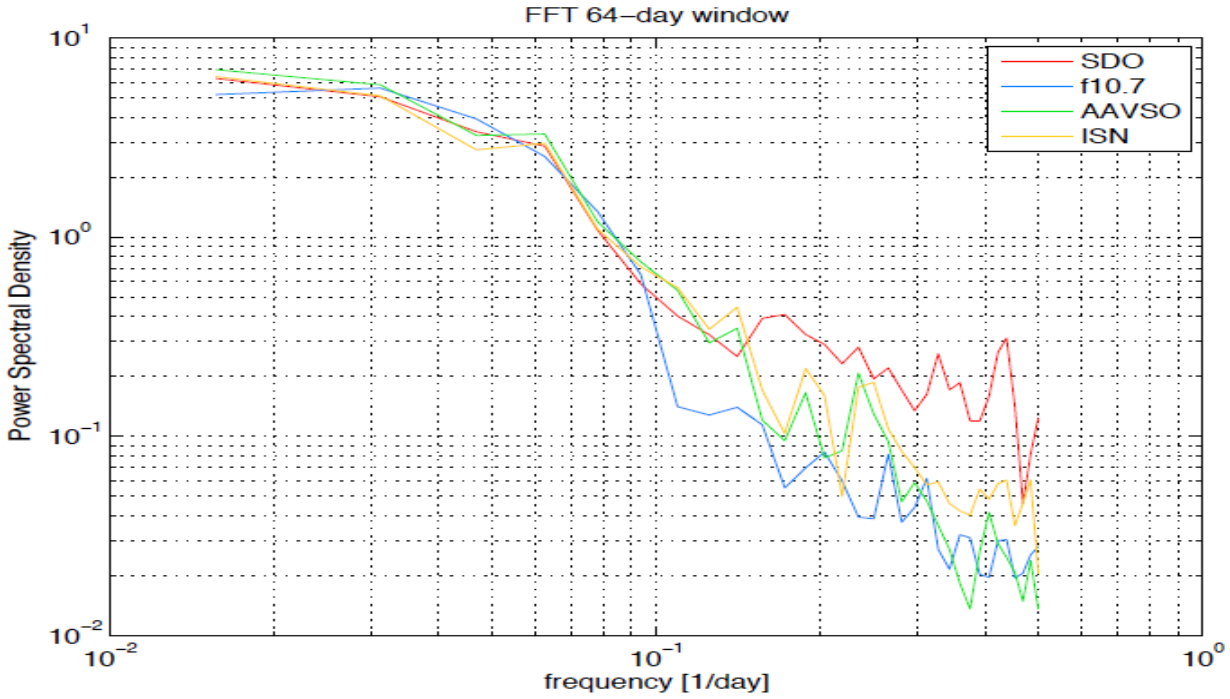
SID Solar Flare Reports – Rodney Howe

ahowe@frii.com

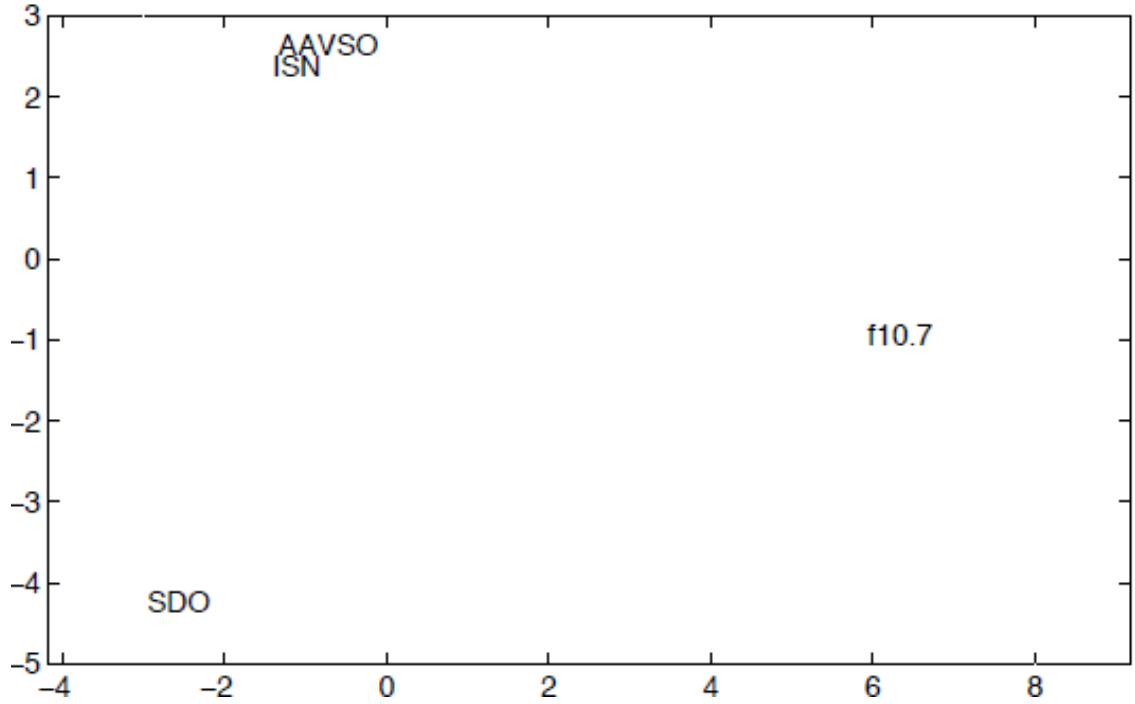
Graphs courtesy Thierry Dudok de Wit (Laboratoire de Physique et Chimie de l'Environment et de l'Espace)

1) Power spectra for AAVSO Ra, SDO HMI data from Jan Alvestad, NRC Penticton 10.7 cm SFU flux values, and the International Sunspot Number SSN (SIDC). The first plot suggests that SDO has a higher signal level by a factor of 4 to 8 when compared to the other indices.

2) The second graph shows their distance map, or how close or far they are from matching up to one another. Clearly, the AAVSO and the ISN fully agree, whereas SDO contains a component that cannot be described by either the radio flux or SDO data itself. It is not due to the higher noise level, it is just different.



The above graph shows the magnitude of difference between these indices.



The above graph shows the 'spatial distance' between these indices.