Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS
SOLAR SECTION

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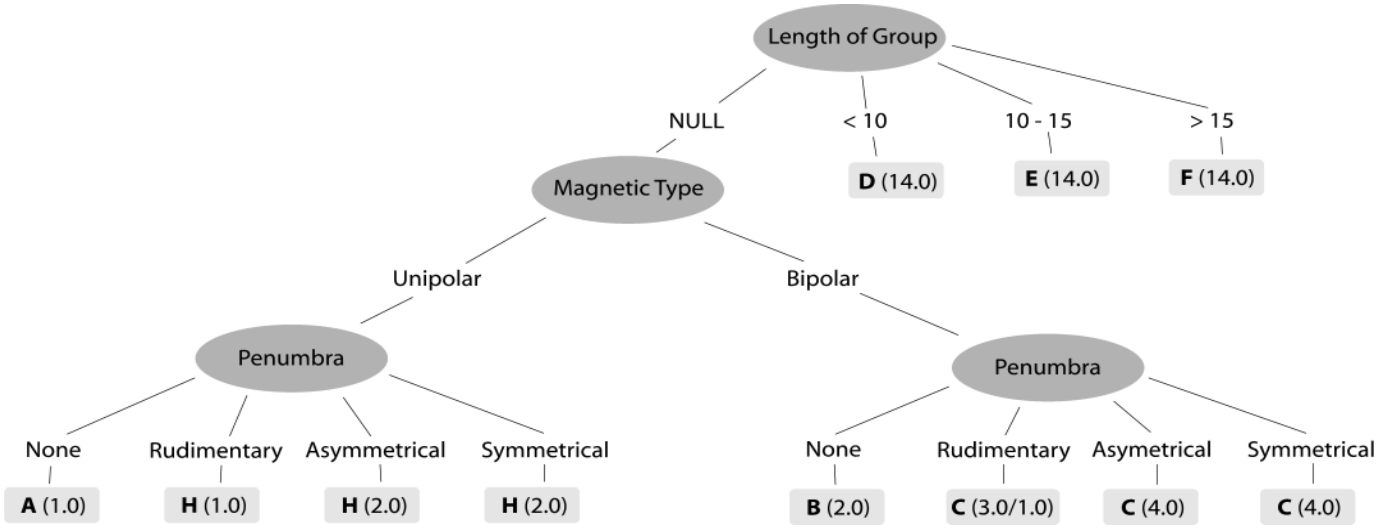
Please find attached, two pictures of two active areas of group and sunspot development. Left was on March 28th, the following one at the right was on April. 1st, 2017 (N is up; W is right). Best regards, Dan Vidican

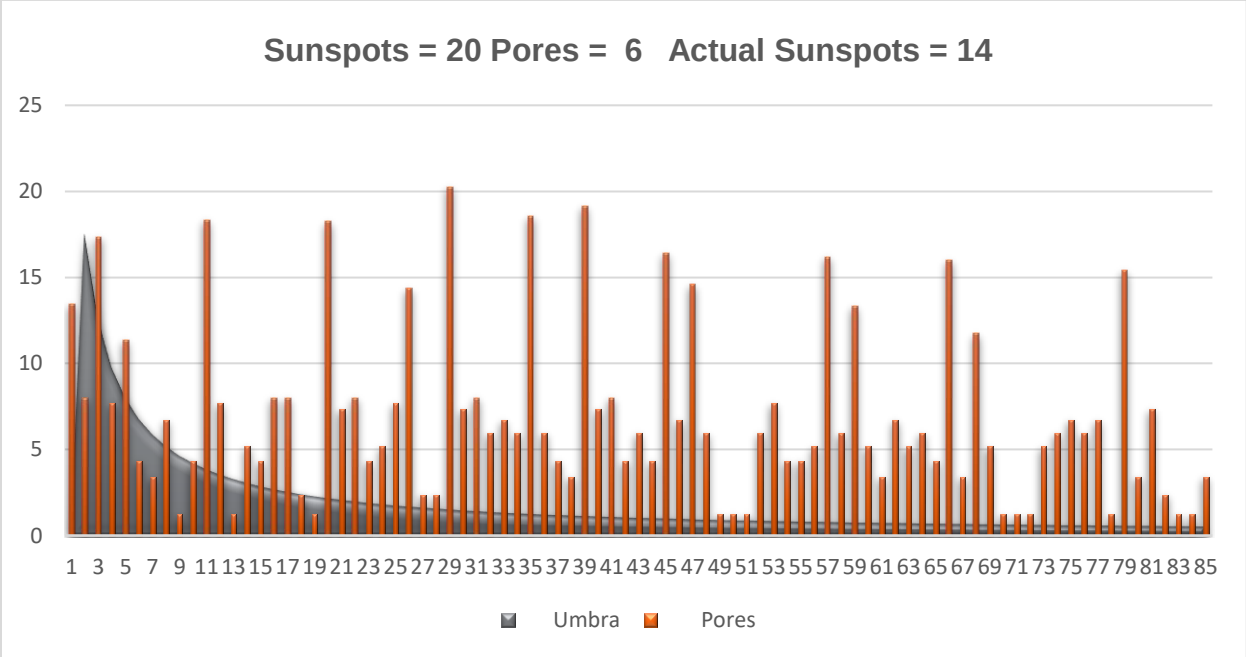


"This decision tree leads to the following observations, which are very useful for concept decomposition process: (1) Classes *D*, *E* and *F* are similar on almost all attributes except attribute group span; (2) Classes *A*, *H* have similar magnetic type (both are unipolar), but they are discerned by the attribute penumbra type; (3) Classes *B*, *C* have similar magnetic type (both are bipolar), but they are discerned by the attribute *penumbra size*." Nguyen et. al, 2006, *Learning Sunspot Classification*, http://gloria-project.eu/wp-content/uploads/2013/10/learning-sunspots-classification-10.1.1.107.6641.pdf

Here is a computer model like that used by Nguyen et.al, except not for artificial computing of the Zurich classification, but rather the model computes the number of sunspots seen by a visual observer given the input parameters shown below. It estimates the number of pores that might be confused with actual sunspot counts, and assumes active region groups have a log-normal distribution at the start of their evolution. The model then takes the mean of the log-normal distribution to compute the actual number of sunspots when subtracted from a random pore count.

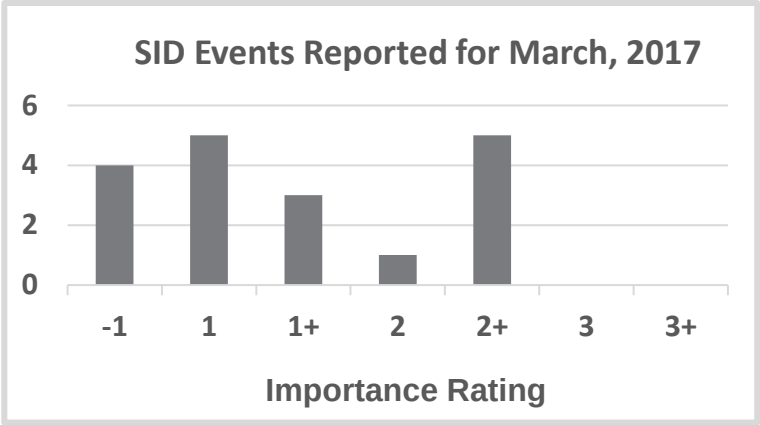
So for March 28th looking at Dan Vidican's image I estimate the following:

Number of Umbra seen 4
Number of total sunspots 20
Percentage of Umbra area with Penumbra 0.30
Percentage of sunspots in Umbra 0.80
Percent Umbra area to total group area 0.75



There are not too many computer models to help visual observers with their group and sunspot counts. This one is designed to include both umbral and penumbral area percentages of a total visual sunspot count with the idea that emerging or evolving group and sunspots spike, and that their decay distribution has a long tail while the pore counts are like boiling water in that they come and go within the hour. So, subtracting the mean pore count from the observed sunspot count gives an estimate for the actual sunspot count. Where for March 28, pores = 6 and the actual sunspot count was 14.

Solar Events

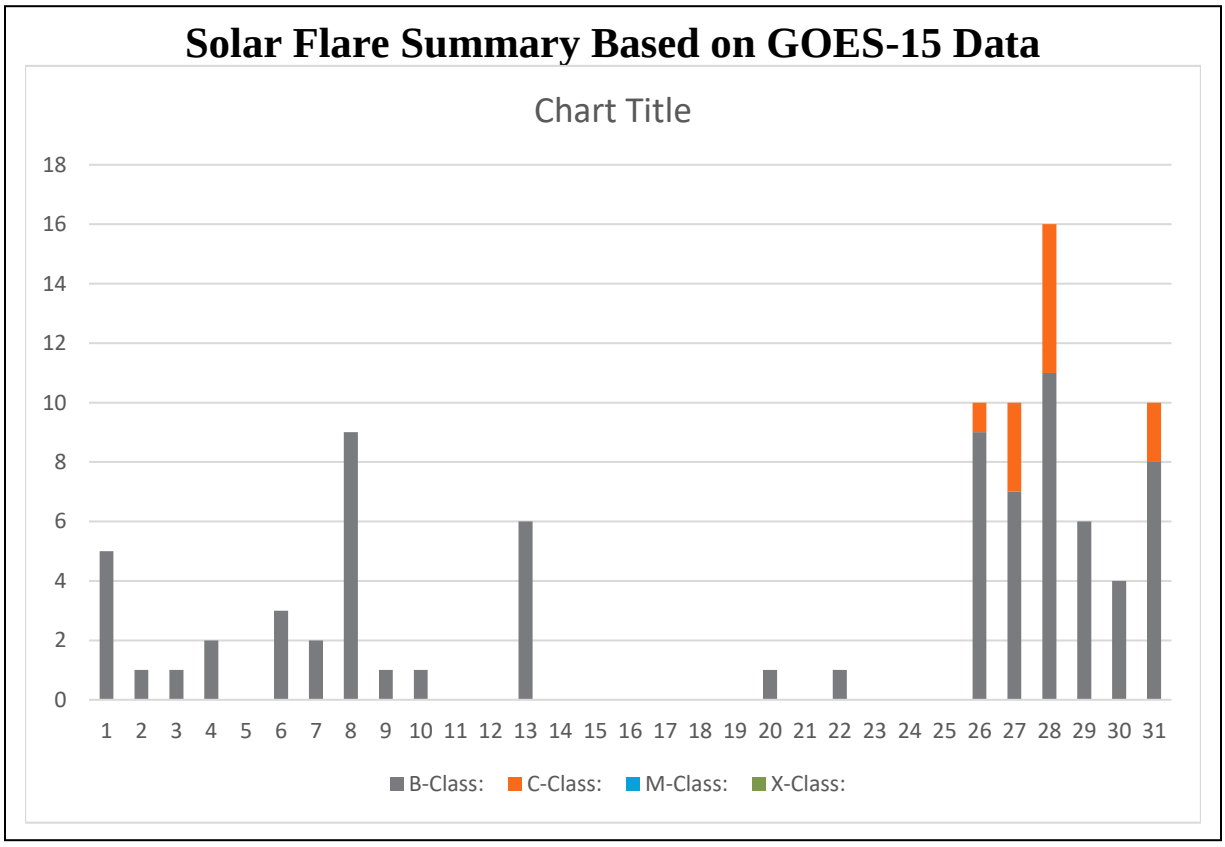


Importance rating: Duration (min)	1-: <19	1: 19-25	1+: 26-32	2: 33-45	2+: 46-85	3: 86-125	3+: 125

Sudden Ionospheric Disturbances (SID) Observers During March, 2017

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	NWC
J Wallace	A97	NAA	R Mrllak	A136	GQD NSY
L Loudet	A118	DHO	S Aguirre	A138	NPM
J Godet	A119	GBZ GQD ICV	G Silvis	A141	NLK
B Terrill	A120	NWC	I Ryumshin	A142	DHO GQD
F Adamson	A122	NWC	R Rogge	A143	DHO GQD
S Oatney	A125	NML	R Russel	A147	NML

There were 89 solar flares measured by GOES-15 for March, 2017: Eleven C class and 78 B class flares. More flaring this month compared to last even though there were 13 days of 'no reports' from the GOES satellite. There were 16 AAVSO SID observers who submitted reports this month.

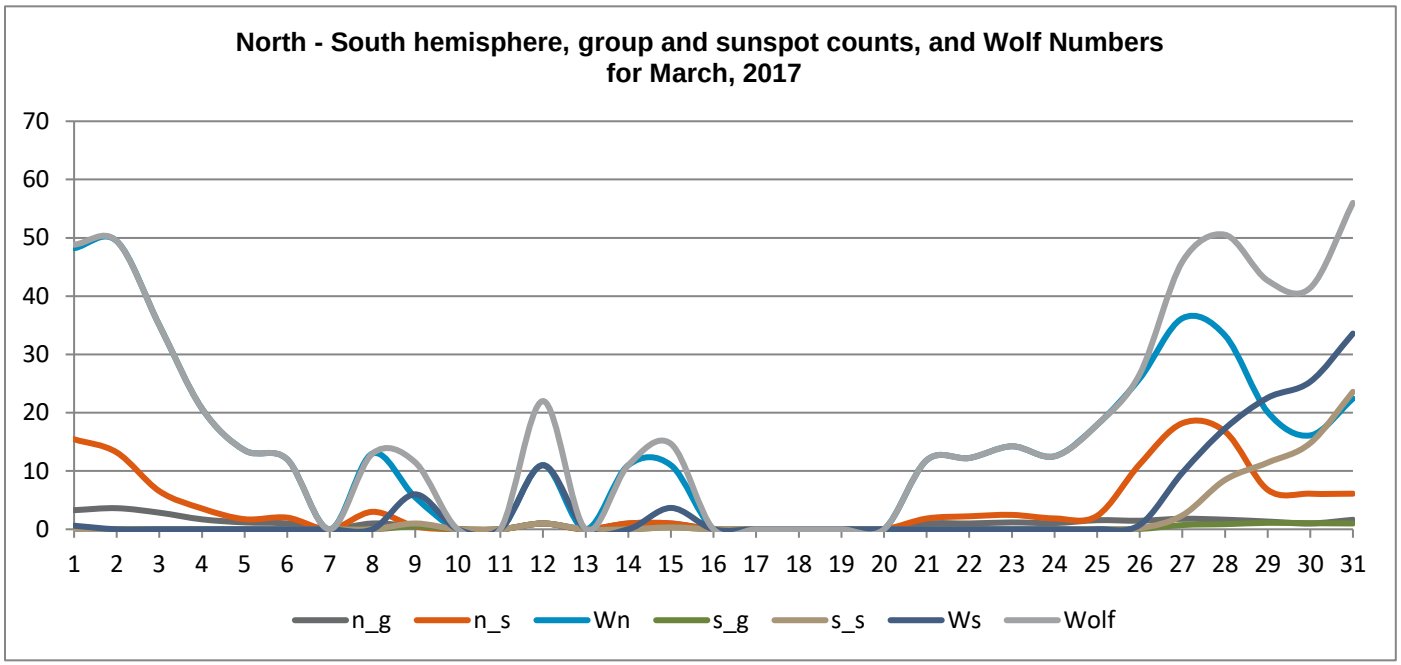


American Relative Sunspot Numbers (Ra) for March, 2017 [**boldface = maximum, minimum**]

DAY	NumObs	RAW	Ra
1	32	49	38
2	33	45	36
3	25	29	22
4	27	5	3
5	31	4	3
6	24	1	0
7	29	0	0
8	32	1	1
9	34	0	0
10	28	0	0
11	29	0	0
12	31	0	0
13	22	0	0
14	27	0	0
15	37	1	0
16	31	0	0
17	33	0	0
18	27	0	0
19	31	0	0
20	26	0	**0**
21	24	9	7
22	29	11	9
23	32	13	10
24	29	12	10
25	30	16	13
26	29	26	20
27	29	41	32
28	32	48	37
29	33	41	34
30	27	41	33
31	29	54	**42**
Average	**29.4**	**14.4**	**11.3**

Obs	#obs	Name
AAX	20	Alexandre Amorim
AJV	27	J. Alonso
ARAG	31	Gema Araujo
ASA	30	Salvador Aguirre
BARH	12	Howard Barnes
BATR	6	Roberto Battaiola
BERJ	26	Jose Alberto Berdejo
BRAB	31	Brenda Branchett
BRAF	16	Raffaello Braga
BROB	18	Robert Brown
CHAG	25	German Morales Chavez
CIOA	17	Ioannis Chouinavas
CKB	20	Brian Cudnik
CNT	13	Dean Chantiles
CVJ	17	Jose Carvajal
DEMF	3	Frank Dempsey
DJOB	12	Jorge del Rosario
DUBF	25	Franky Dubois
FERJ	14	Javier Ruiz Fernandez
FLET	27	Tom Fleming
FLF	14	Fredirico Luiz Funari
FTAA	7	Tadeusz Figiel
FUJK	19	K. Fujimori
HAYK	11	Kim Hay
HIVB	8	Ivan Hajdinjak
HMQ	7	Mark Harris
HOWR	26	Rodney Howe
JDAC	8	David Jackson
JENS	3	Simon Jenner
KAND	22	Kandilli Observatory
KAPJ	15	John Kaplan
KNJS	30	James & Shirley Knight
KROL	21	Larry Krozel
LEVM	12	Monty Leventhal
LRRA	27	Robert Little
MARE	7	Enrico Mariani
MCE	3	Etsuiku Mochizuki
MJAF	30	Juan Antonio Moreno Quesada
MJHA	29	John McCammon
MUDG	2	George Mudry
MWU	14	Walter Maluf
OATS	2	Susan Oatney
ONJ	6	John O'Neill
RLM	10	Mat Raymonde
RRO	7	Ralph Rogge
SIMC	9	Clyde Simpson
SNE	8	Neil Simmons
SONA	9	Andries Son
SDOH	31	Jan Alvested(SDO)
SPIA	9	Piotr Skorupski
STAB	29	Brian Gordon-States
SUZM	27	Miyoshi Suzuki
TESD	24	David Teske
URBP	20	Piotr Urbanski
VARG	29	A. Gonzalo Vargas
VIDD	10	Dan Vidican
WGI	1	Guido Wollenhaupt

WILW	18	William M. Wilson	**Total**	**Observers:**	**59**
WRP	1	Russell Wheeler	**Total**	**Observations:**	**955**



There were 35 out of 59 observers who counted northern and southern hemisphere groups and sunspots this month. It looks like Northern hemisphere was predominant with days of crossover on the 29th.

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