

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR DIVISION

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American Relative Sunspot Numbers, R_a , for August 1998

Date	R_a Final		Date	R_a Final		Date	R_a Final
1	72		11	134		21	103
2	79		12	126		22	97
3	83		13	95		23	97
4	73		14	83		24	86
5	87		15	85		25	85
6	103		16	106		26	93
7	104		17	95		27	101
8	107		18	98		28	109
9	137		19	106		29	122
10	136		20	100		30	142
						31	117

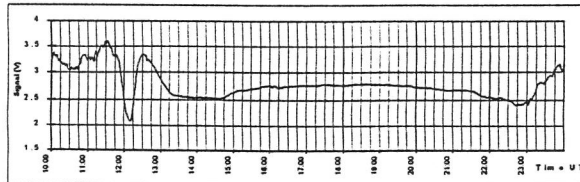
Monthly Mean = 101.9

(Based on 1141 observations contributed by 65 observers)

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Sudden Ionospheric Disturbance Report

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Sudden Ionospheric Disturbances Recorded During August 1998

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
980801	1610	3	980808	2342	2+	980818	0416	2+	980829	0457	1
980801	1815	2+	980809	0515	2	980818	0645	2	980829	1534	2
980805	1612	2	980809	0848	2+	980818	0819	2+	980829	1838	2
980806	1035	1	980809	1420	2+	980818	2220	2	980830	0525	1
980806	1130	1+	980809	1625	2	980819	1024	2+	980830	0621	1+
980806	1205	2	980809	1717	2+	980819	1240	2+	980830	0728	1+
980806	1225	1-	980809	1943	1	980819	1415	2+	980830	1450	2
980806	1427	1-	980809	2057	1+	980819	2040	2+	980830	1651	2
980806	1604	2	980810	1105	1-	980819	2144	2+	980830	1809	1
980806	1805	1-	980810	1455	1-	980820	1531	1-	980830	1838	1+
980806	1831	1-	980812	1740	1+	980821	0622	1+	980830	2025	2
980806	1955	1+	980813	1338	1+	980821	0858	2+	980830	2156	2
980807	0710	1-	980813	1408	1	980821	2113	2+	980830	2253	2
980807	0722	2+	980813	1507	1	980822	1504	1-	980831	1534	2+
980807	1225	1-	980813	1755	2+	980822	1655	2+	980831	1807	2
980807	1419	2	980813	1924	1-	980822	1933	2	980831	1959	2
980807	1845	1	980814	0600	1+	980822	2033	1	980831	2100	2+
980808	0317	1	980814	0830	2	980823	0612	1	980831	2209	1+
980808	0822	1+	980815	0630	2	980823	0635	2+	980831	2214	1+
980808	1249	1+	980816	1755	3	980823	0934	2+			
980808	1458	2+	980817	1819	2+	980823	1126	2			
980808	1850	2+	980817	2118	2+	980824	2205	2+			

The events listed above meet at least one of the following criteria:

- 1) reported in at least two observers' reports.
- 2) visually analyzed with definiteness rating = 5 on submitted charts
- 3) reported by overseas observers with high definiteness rating

The following observers submitted reports and/or charts for August:

A-05 Hossfield, New York * A-09 Scharlach, Arizona * A-50 Winkler, Texas
 A-52 Overbeek & Toldo, Republic of South Africa * A-62 Stokes, Ohio * A-63 Ellerbe, Spain * A-72 Witkowski, Florida
 A-80 King, England * A-81 Landry, New Hampshire * A-82 Lawrence, Indiana * A-84 Moos, Switzerland.
 A-87 Hill, Massachusetts * A-90 Mandaville, Arizona

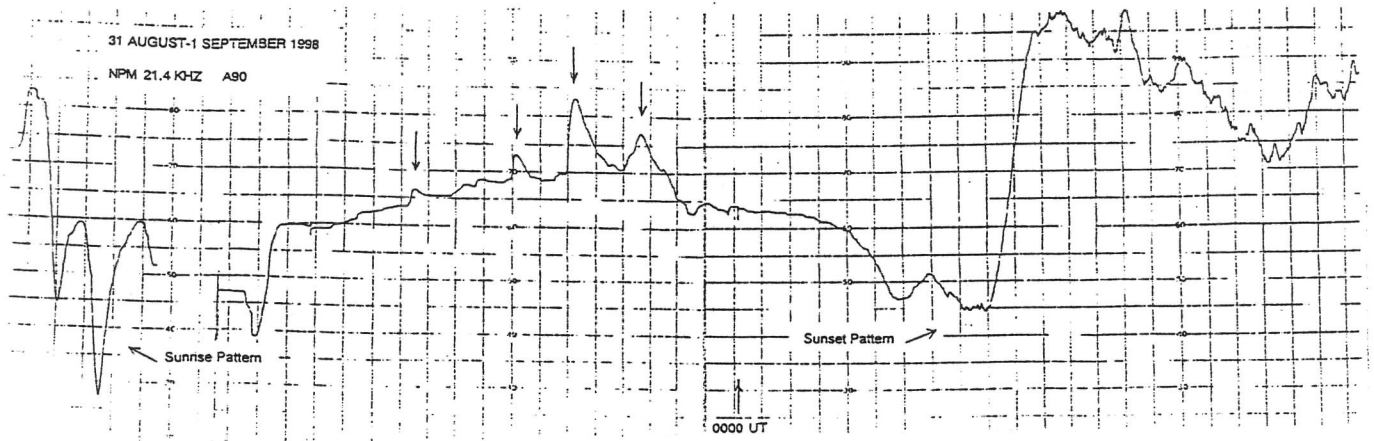
SID Database in Progress

As announced at the 87th Spring Meeting of the AAVSO in Boulder, an electronic file database containing all SID events published in the monthly AAVSO Solar Bulletin is in development. Currently, the hardcopy reports are the only record maintained by AAVSO headquarters. The electronic database will facilitate searches and statistical analysis of the thousands of events recorded by SID program observers since 1958. Individual files contain the recorded events and observer IDs for each month. As the data conversion progresses, files are continually uploaded to the following personal webpage:

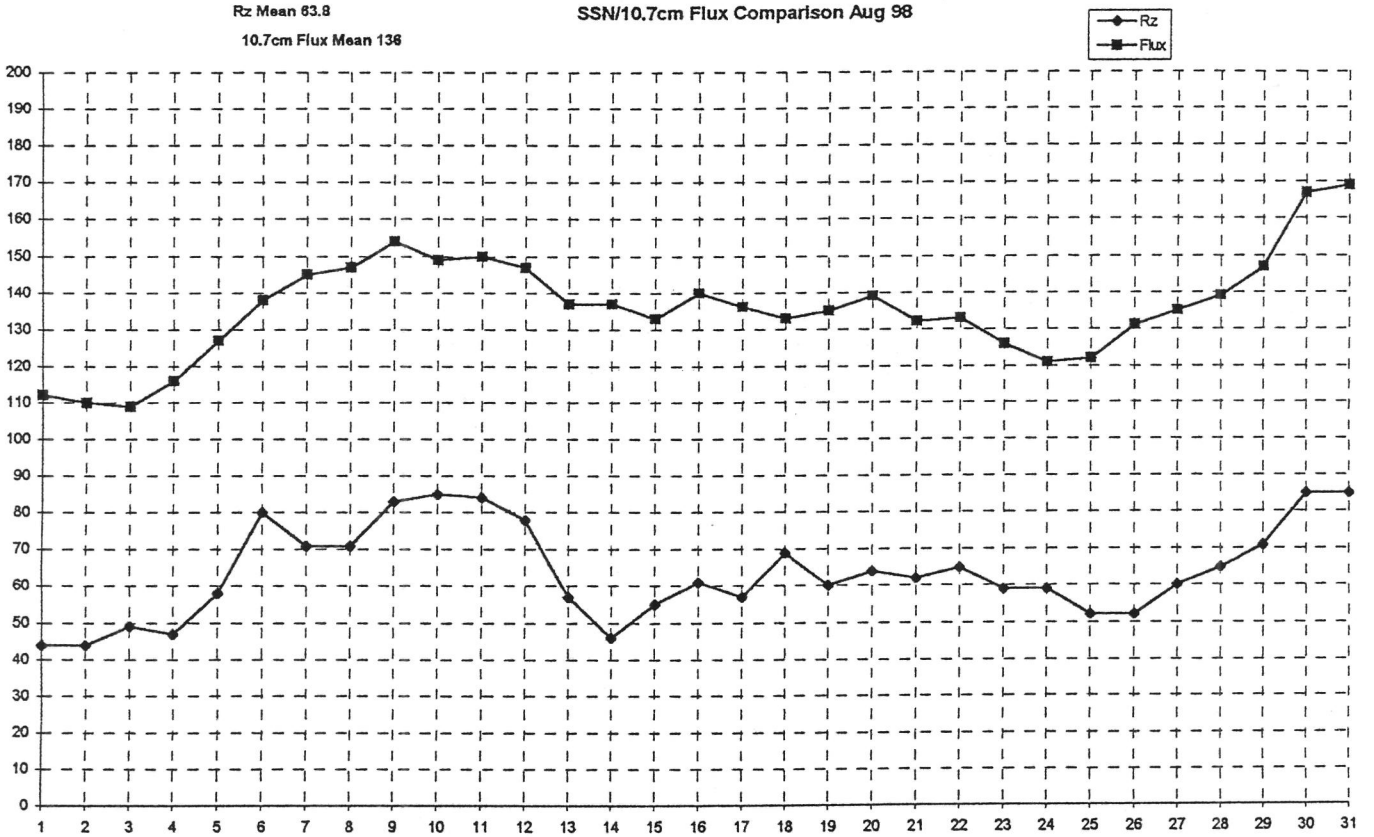
<http://www.ipfw.indiana.edu/kt2/lawrence/web/sidbase.htm>

Files from January 1992 to the present may be accessed by selecting the month of interest. The conversion process requires manually entering data from hardcopy reports and then verification of accurate transcription. This work will continue as time permits. Eventually the database will be accessed through the AAVSO webpage and monthly updates maintained at that site.

Four SESs recorded at the very end of August are shown below. The recording was made by Jim Mandaville who is new observer, A-90, in Arizona, USA. Jim uses an Art Stokes gyrotor receiver tuned to NPM in Hawaii. A Heathkit potentiometer recorder made the trace.

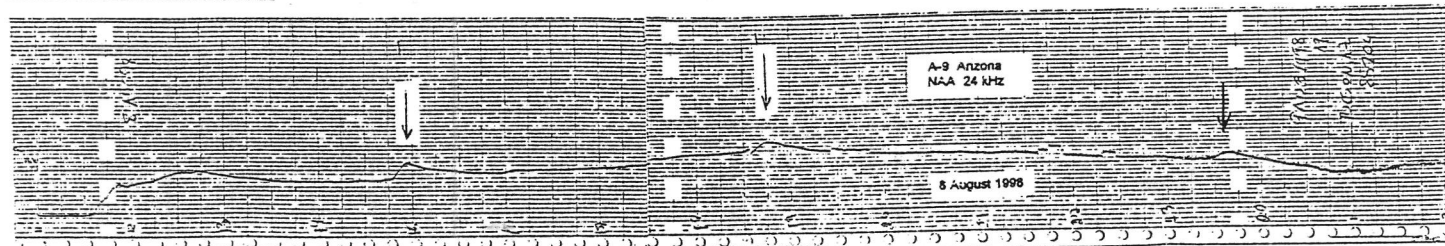
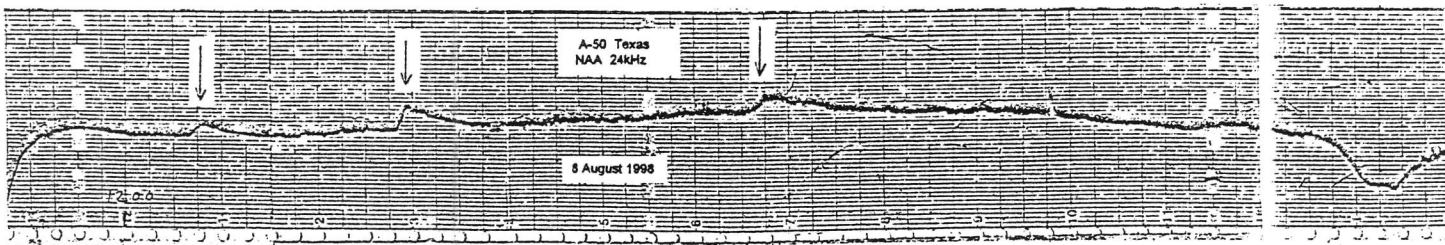


Rz Mean 63.8
SSN/10.7cm Flux Comparison Aug 98
10.7cm Flux Mean 138

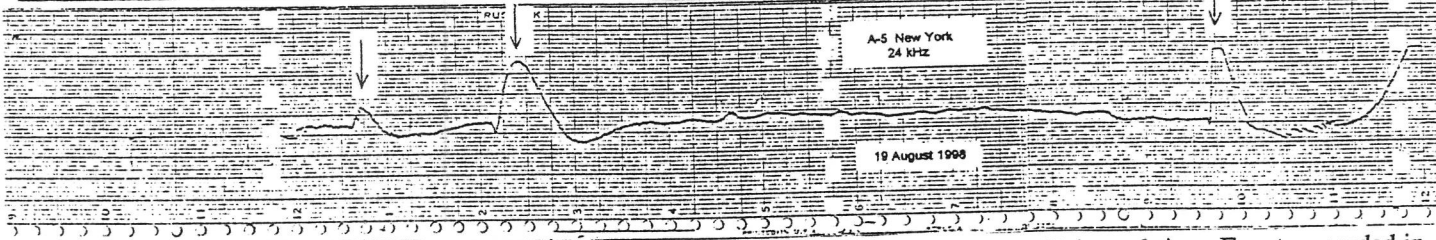
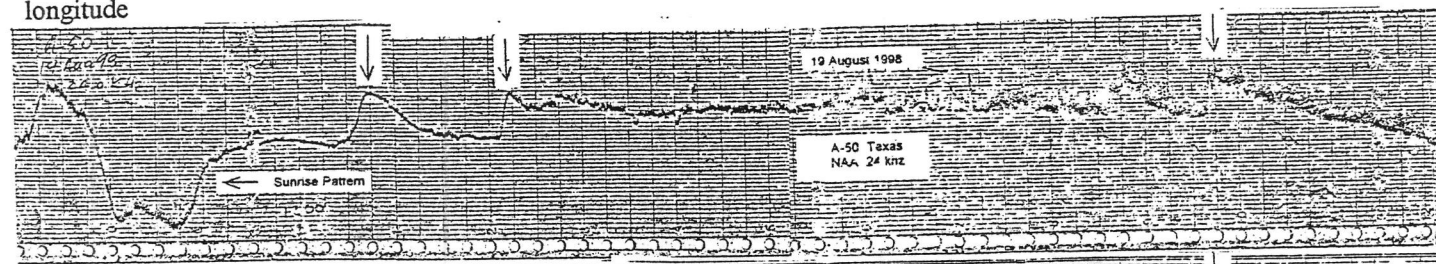


Rz	44	44	49	47	58	80	71	71	83	85	84	78	57	46	55	61	57	69	60	64	62	65	59	59	52	52	60	65	71	85	85
Flux	112	110	109	116	127	138	145	147	154	149	150	147	137	137	133	140	136	133	135	139	132	133	126	121	122	131	135	139	147	167	169

The graph above shows 10.7 cm flux plotted against Zurich sunspot numbers computed from observations of seven AAVSO sunspot observers who count according to the Zurich system. The Zurich reduction formula was used to reduce the counts to true Zurich Relative Sunspot Numbers, Rz. The 10.7 cm flux was calibrated against the Zurich Relative Sunspot Numbers during sunspot cycle 20 by Arthur Covington at the Dominion Astrophysical Observatory in Canada. The graph was prepared by AAVSO sunspot observer, Tom Lizak.



Four moderate size SESs that occurred on 8 August are compared above. Sunrise in Tucson is about an hour later than in Houston so A-9 did not record the early 1245 UT event because it was too soon after his sunrise. On the other hand A-50 did not record the later 2330 UT SES because it was too close to his sunset. It is advantageous to have observers spread out in longitude



The chart paper used above is printed with hours marked 1 to 12 but time is kept in 24-hour Universal time. Events recorded in the United States are usually later than 1200 UT so 12 hours must be added to the time printed on the chart. The 19 August SES reaching maximum at 9:45 chart time is 9:45 plus 12 = 2145 UT. It is called an SES, an acronym for Sudden Enhancement of Signal. In this case the signal that is enhanced is NAA on 24 khz, a powerful 1-Megawatt US Navy transmitter in Cutler, Maine in the Northeast corner of USA. The solar flare that produced this SES rose to maximum in about 3 minutes as shown by the sudden rise in the trace starting at 2142 UT. The enhancement decays to normal by about 2210 which probably represents the recombination rate of the free electrons that were produced in the D-layer of the ionosphere by X-rays and far ultraviolet radiation from the flare.

