U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White. Administrator
ENVIRONMENTAL DATA SERVICE
Thomas S. Austin, Director

Solar - Geophysical Data

No. 342 February 1973 Part I (Prompt Reports)

Data for: Jan 1973
Dec 1972

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

For obtaining bulletins on a data exchange basis, send request to: World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80302.

For sale through the National Climatic Center, Federal Building, Asheville, NC 28801, Attn: Publications. Subscription Price: $30.50 annually for both Part I (Prompt Reports) and Part II (Comprehensive Reports) or $15.50 annually for either part. Extra issue included. For foreign mailing add $8.00 for both parts or $4.00 for either part. Single issue price $1.25 for either part and 75¢ for the extra issue. Make checks and money orders payable to: Department of Commerce, NOAA.

* * * * *

To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, CRPL-FB 135*, pages, issue date, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302).

*CRPL-FB 135 through 269
IER-FB 270 through 298
299 Part I or 299 Part II to number of current issue.

SOLAR - GEOPHYSICAL DATA

No. 342

Issued in two parts

Hope I. Leighton, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

CONTENTS

Part I (Prompt Reports)

	Page
Index for 1972 and 1973	2
Data for January 1973	3-20
Data for December 1972	21-114

Part II (Comprehensive Reports)

Index for 1972 and 1973	2
Data for August 1972	3-95
Data for July 1972	97-105
Miscellaneous Data	107-111

Retrospective World Interval -- July 26-August 14, 1972
X-ray maps -- OSO-5 - November 1972
Neutron Monitors -- Dallas - February 1972
Churchill - February-May 1972

INDEX FOR 1972 - 1973 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1972 Aug	Sep	Oct	Nov	Dec	1973 Jan
A.	Solar and Interplanetary Phenomena						
A.1	Sunspot Drawings	338	339	340	341	342	
A.2a	Zürich Provisional Relative Sunspot Numbers R_Z	337	338	339	340	341	342
A.2b	Zürich Final Sunspot Numbers R_Z						
A.2c	American Relative Sunspot Numbers R_A'	337	338	339	340	341	342
A.3a	Mt. Wilson Magnetograms	338	339	340	341	342	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	338	339	340	341	342	
A.4	Hα Spectroheliograms	338	339	340	341	342	
A.5	Calcium Plage Drawings - McMath (or Catania)	338	339	340	341	342	
A.5a	Calcium Plage (McMath) and Sunspot Regions	338	339	340	341	342	
A.5b	McMath Daily Calcium Plage Index	338	339	340	341	342	
A.7b	Coronal Line Emission	338	339	340	341	342	
A.7c	White-Light Corona (NRL OSO-7, 1971-083A)	338	339	340	341	342	
A.7d	Solar EUV Spectroheliogram Fe XV 284 Å (GSFC OSO-7, 1971-083A)	338	339	340	341	342	
A.7e	Solar XUV Coronograms (NRL OSO-7, 1971-083A)			340	341	342	
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	337	338	339	340	341	342
A.8ac	2800 MHz - Daily Values of Adjusted Solar Flux (ARO-Ottawa)	337	338	339	340	341	342
A.8g	15400, 8800, 4995, 2695, 1415, 606, 410, 245 MHz Adj. Solar Flux (AFCRL)	337	338	339	340	341	342
A.9a	9.1 cm Radio Maps of the Sun (Stanford)	338	339	340	341	342	
A.9b	21 cm Radio Maps of the Sun (Fleurs)	338	339	340	341	342	
A.9c	8.6 mm Radio Maps of the Sun (Prospect Hill)	338	339	340	341	342	
A.10a	169 MHz - Interferometric Observations (Nançay)	337	338	340	340	341	
A.10c	21 cm East-West Solar Scans (Fleurs)	337	338	339	340	341	342
A.10d	43 cm East-West Solar Scans (Fleurs)	337	338	339	340	341	342
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	337	338	339	340	341	342
A.11aa	Solar X-ray Radiation (Explorer 37 or 44)	338	339	340	341	342	
A.11ab	Solar X-ray Radiation (Explorer 37 or 44) Graphs	342					
A.11e	Solar X-ray Spectroheliograms (OSO-5)	338	339	340	342		
A.11f	Solar X-ray Spectroheliograms (GSFC OSO-7, 1971-083A)					342	
A.12aa	Solar Protons (Explorer 41 or 43) Daily hourly values	342					
A.12ab	Solar Protons (Explorer 41 or 43) Graphs	342					
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	337	---	339	340	---	342
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	337	338	339	340	341	342
A.12c	Cosmic Ray Protons (ATS-1)	337					
A.13a	Solar Wind (Pioneers 6 & 7)	337	---	339	340	341	342
A.13c	Solar Wind (Vela 6B)						
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	---	339	340	---	342
A.17	Interplanetary Magnetic Field (Pioneer 9)	337	338	339	340	341	342
A.18	Interplanetary Electric Field (Pioneer 8)	---	---	339	340	---	342
A.18	Interplanetary Electric Field (Pioneer 9)	337	338	339	340	341	342
B.	Ionospheric (and Radio Wave Propagation) Phenomena						
B.51ca	High Latitude Quality Figures and Forecasts	338	339	340	341	342	
B.51cb	High Latitude Comparison Graphs	338	339	340	341	342	
B.52	Graphs of Transmission Frequency Range	338	339	340	341	342	
B.53	Quality Figures based on Frequency Ranges	338	339	340	341	342	
C.	Flare-Associated Events						
C.1a	Optical Observations Flares	337	338	339	340	341	342
C.1ba	Optical Observations Flares (Including Standardized Data)	342					
C.1d	Flare Patrol Observations	337	338	339	340	341	342
C.1e	Flare Indices (by day)	342					
C.1f	Flare Index by Region						
C.3	Solar Radio Waves - Fixed Frequencies - Outstanding Occurrences	342					
	Solar Radio Waves - Fixed Frequencies - Selected	337	338	339	340	341	342
C.3t	43.25, 80 and 180 MHz Selected Bursts (Culgoora)	342					
C.4aa	10-2000 MHz - (Fort Davis)	338	339	340	341	342	
C.4b	7.6-80 MHz - (University of Colorado)	338	339	340	341	342	
C.4d	8-8000 MHz - (Culgoora)	338	339	340	341	342	
C.4e	30-1000 MHz - (Weissenau, G.F.R.)	338	339	340	341	342	
C.4f	24-48 MHz - (AFCRL, Sagamore Hill)	338	339	340	341	342	
C.5b	Solar X-ray Radiation (Explorer 35)	342					
C.5c	Solar X-ray Radiation (Explorer 44)	338	339	340	341	342	
C.6	Sudden Ionospheric Distrubances	338	339	340	341	342	
D.	Geomagnetic and Magnetospheric Phenomena						
D.1a	Geomagnetic Indices Ci, Cp, Kp, Ap - Selected Days	338	339	340	341	342	
D.1b	27-Day Chart of Kp Indices for Year	342	342	342	342	342	
D.1c	27-Day Chart of C9 for Year	342	342	342	342	342	
D.1d	Principal Magnetic Storms	338	339	340	341	342	
D.1e	Reduced Magnetograms	342					
D.1f	Sudden Commencement and Solar Flare Effects	338	339	340	341	342	
F.	Cosmic Rays						
F.1a	Cosmic Ray Neutron Counts (Deep River)						
F.1b	Cosmic Ray Neutron Counts (Climax)						
F.1c	Cosmic Ray Neutron Counts (Dallas)	338	339	340	341	342	
F.1d	Cosmic Ray Neutron Counts (Churchill)						
F.1e	Cosmic Ray Neutron Counts (Alert)						
F.1f	Cosmic Ray Neutron Counts (Calgary)	338	339	340	341	342	
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	338	339	340	341	342	
H.	Miscellaneous						
H.60	IUWDS Alert Decisions	337	338	339	340	341	342
H.62	Abbreviated Calendar Record						

JANUARY 1973 DATA

Contents

	Page
Alert Period	
IUWDS Alert Periods (Advance and Worldwide)	5
Daily Solar Indices	
12-Month Tables Sunspot Numbers, R_z, and 2800 MHz Flux Adjusted to 1 A.U.	6
Combined Table Sunspot Numbers and Solar Fluxes	7
Graph of Sunspot Cycles	8
Zürich Smoothed Observed and Predicted Sunspot Numbers	9
Solar Flares	
Flares of numerical Importance 1 or Greater	10
Subflares	11
No-Flare-Patrol Chart	12
Solar Radio Waves	
169 MHz Solar Interferometric Chart - Nancay	13
10.7 cm East-West Solar Scans - ARO, Ottawa	14
21 cm East-West Solar Scans - Fleurs	15
43 cm East-West Solar Scans - Fleurs	16
Selected Fixed-Frequency Occurrences	17-18
Spacecraft Observations	
Pioneer 6, 7 and 8	19
Pioneer 9	20

For explanations of the data contained herein see "Descriptive Text" published as supplement to February 1973 "Solar-Geophysical Data" (Number 342).

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

JANUARY 1973

JAN 1973	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT	
			NO.	TYPE INCLUDING FLARE ACTIVITY EXPECTED
01	0400			THREE QUIET; SOLNIL
02	0400			FOUR QUIET; SOLNIL
03	0400			N08E40 ERUPTIVE; FOUR QUIET; SOLNIL
04	0400			N08E27, N14E54 ERUPTIVE; TWO QUIET; SOLNIL
05	0400			N08E13, N14E41 ERUPTIVE; THREE QUIET; SOLNIL
06	0400			N08E00, N13E28 ERUPTIVE; TWO QUIET; SOLNIL
07	0400			N13E15, N07W13 ERUPTIVE; TWO QUIET; SOLNIL
08	0400			N13E02 ERUPTIVE; FOUR QUIET; SOLNIL
09	0400			FOUR QUIET; SOLNIL
10	0400			SIX QUIET; SOLNIL
11	0400			N08W68 ERUPTIVE; FOUR QUIET; SOLNIL
12	0400			N08W86 ACTIVE; N12W51 ERUPTIVE; THREE QUIET; SOLNIL
13	0400			N13W67 ERUPTIVE; ONE QUIET; SOLNIL
14	0400			THREE QUIET; SOLNIL
15	0400			TWO QUIET; SOLNIL
16	0400			FOUR QUIET; SOLNIL
17	0400			ONE QUIET; SOLNIL
18	0400			THREE QUIET; SOLNIL
19	0400			FOUR QUIET; SOLNIL
20	0240	BOULDER MAGSTORM BEGINS 20/0110Z 20/0240Z GRADUAL BEGINNING 19/2100Z		
	0400		20473	MAGSTORM BEGINS 20/0230Z MINOR; FIVE QUIET; SOLNIL
21	0400		21474	MAGSTORM EXISTS MINOR; FOUR QUIET; SOLNIL
22	0400		22475	MAGSTORM ENDS 21/1030Z; FOUR QUIET; SOLNIL
23	0400			FIVE QUIET; SOLNIL
24	0400			SIX QUIET; SOLNIL
25	0400			SEVEN QUIET; SOLNIL
26	0400			FOUR QUIET; SOLNIL
27	0400			TWO QUIET; SOLNIL
28	0400			ONE QUIET; SOLNIL
29	0400			THREE QUIET; SOLNIL
30	0400			FIVE QUIET; SOLNIL; STRATWARM WARM CELL OVER CENTRAL EURASIA HAS JOINED ALEUTIAN SIBERIAN SYSTEM LEADING TO SINGLE INTENSIFIED SYSTEM SLOPING NORTHWEST FROM MIDDLE STRATOSPHERE OVER NORTHEAST SIBERIA TO UPPER STRATOSPHERE OVER ASIAN ARCTIC OCEAN
31	0400			TWO QUIET; SOLNIL; STRATWARM EXISTS SIBERIA TO ASIAN ARCTIC. STRONGEST UPPER STRATOSPHERIC WARMING OVER BARENTS SEA

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

1972 PROVISIONAL — 1973

DAY	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1	53	74	40	17	78	68	93	121	70	70	35	45
2	52	89	46	39	96	74	81	91	65	67	23	53
3	39	96	43	32	102	85	85	69	73	49	20	55
4	46	84	38	27	116	91	80	68	73	26	20	60
5	49	72	32	49	132	104	93	77	67	19	18	72
6	40	64	51	68	103	92	85	78	57	16	18	83
7	49	74	76	79	95	97	65	73	54	8	24	66
8	59	84	75	73	87	86	56	65	52	7	33	60
9	58	81	74	99	76	75	59	57	30	14	42	70
10	57	81	88	91	68	64	44	43	24	12	51	55
11	57	68	75	79	63	62	25	43	26	30	59	52
12	62	80	80	92	48	77	50	33	16	26	60	32
13	73	91	78	103	43	89	55	31	14	25	63	35
14	89	104	65	130	60	86	37	35	8	27	60	15
15	108	114	67	113	88	61	39	42	14	18	64	10
16	137	104	60	125	98	60	57	53	34	25	66	11
17	137	114	55	140	101	59	62	44	30	32	76	27
18	146	110	59	133	86	55	52	35	28	21	51	42
19	162	112	62	127	83	73	54	30	44	36	38	47
20	159	113	65	105	92	59	48	44	45	54	54	60
21	156	110	85	89	96	70	60	60	53	58	70	62
22	167	113	85	77	87	72	85	69	63	62	57	62
23	141	119	83	59	84	68	71	59	66	68	60	60
24	120	119	82	58	79	64	82	71	81	65	43	50
25	93	112	88	56	77	62	64	82	91	54	39	39
26	88	55	88	55	73	83	79	78	95	52	32	27
27	79	34	62	41	66	82	89	77	103	51	31	8
28	88	25	66	44	78	86	113	67	84	58	26	14
29	91	29	38	58	73	106	147	70	65	40	20	7
30		42	22	79	73	112	141	75	90	37	29	16
31		37		85		115	137		84		37	13
MEAN	91.6	84.0	64.3	78.1	83.4	78.6	73.8	61.3	54.8	37.6	42.5	42.2

1971 yearly mean = 66.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1972 — 1973

DAY	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1		125.5	96.0	95.0	128.2	133.0	156.3	144.3	114.7*	129.9	91.1	93.9
2	106.5	129.7	97.3	94.9	130.0	137.0	150.4	139.7*	108.4*	121.8*	89.4	98.2
3	104.8	131.1	98.1	97.7	137.5*	139.9	147.1*	129.4*	107.3	113.9	85.2	105.1*
4	103.6	137.1	101.0	102.7	149.5*	146.7*	146.0	122.0	103.3	115.8	82.3	109.3*
5	102.6	140.8	105.3	108.7	164.8	150.2	146.5	117.0*	100.6	102.6	80.4	113.3
6	98.6	143.7	118.1	117.6	159.1	146.1	143.4	119.2	98.4	93.2	77.8	115.0
7	102.2	143.3	121.3	120.9*	152.7	143.2	139.0*	110.4	96.1	85.7	87.1	112.3
8	104.3	141.6	123.8	128.8*	150.2*	136.7	125.3	115.9	97.2	82.5	91.6*	103.2
9	106.3	137.4	130.5	133.0	149.1*	127.1	123.8	112.9	100.5	82.3	94.7*	103.7
10	113.6*	132.5*	130.3	138.3	139.5	121.7	118.6	107.2	94.7	84.7	97.2*	103.8
11	118.4	134.9	129.8	140.8*	143.2*	123.6*	113.3*	102.7	93.5*	88.3	105.1*	102.8
12	123.9	128.5	128.3	148.6	149.7	119.3	107.6	100.6	94.7	88.7	108.9	103.5
13	126.3	129.3	128.4*	161.6	138.9*	119.9*	101.7	94.6	94.5	86.7	111.2*	100.9*
14	136.7	129.7	125.0	162.8	136.5	119.5	97.9	99.5	97.0	85.1	114.8*	96.2
15	145.8	135.3	126.0	164.6	139.5*	117.6	97.6	103.4	102.1*	86.5	116.1*	94.6
16	153.2	133.0	124.3	161.8	142.7*	115.1	100.6	103.1	106.2	89.6	110.2	93.8
17	168.2	133.8	120.3	169.3	149.6	114.6*	106.4	100.3	112.1*	91.5	111.9	94.2
18	184.4*	131.9	115.7	165.5	149.0*	108.9	109.6	102.6	111.0	94.6	112.4	95.3
19	190.6	131.0	115.4	156.7	143.2*	108.9	116.2	106.2	117.1*	99.7	113.2	94.8
20	202.5*	135.2	111.3	152.3	142.5	110.9	117.9	113.2	122.2	109.4	111.4	98.3
21	189.6*	135.8	106.9	148.2	139.0*	111.7	119.5	113.4*	132.8*	109.3*	113.4*	97.9
22	180.4*	131.2	109.4	143.3	135.1	111.6	127.3*	119.4*	141.7	110.9*	107.9*	98.5
23	175.6	140.0*	108.4	135.2	130.7	109.6	122.9*	125.2*	151.2*	115.3*	106.2	97.2
24	164.2	126.6	110.2	135.5	128.5	109.5	122.6	126.8	156.5	115.4*	101.1	96.9
25	151.9	116.4	111.6	127.3	125.5	112.4	127.8	126.3*	171.8	112.7	103.3*	95.6
26	149.3*	110.5	109.9	116.3*	120.8	120.6	137.4*	122.5*	170.0*	108.6	97.7	95.3
27	140.3	104.1	109.0*	114.3	121.9*	127.2	144.1	118.3*	167.6*	102.3	97.6	93.4
28	133.2	101.1	103.2	110.8*	127.3	133.3*	147.2*	116.4	159.1*	97.5	91.9	91.7
29	130.5*	96.5	98.6	116.2	132.4	139.1	163.3*	115.2		92.7	92.8*	91.4
30		98.3	97.0	116.8	134.5	141.2*	163.3	118.5	144.6*	95.1	92.0*	89.7
31		95.7		122.5		150.2	154.2*		140.1*		94.3	87.7
MEAN	138.4	127.1	113.7	132.5	139.7	126.0	128.9	114.9	120.2	99.7	99.7	99.0

* adjusted for burst

DAILY SOLAR INDICES

JANUARY 1973

JAN 1973	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX OTTAWA 2800	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$		AFCRL 15400	AFCRL 8800	AFCRL 4995	OTTAWA 2800	AFCRL 2695	AFCRL 1415	AFCRL 606	AFCRL 410	AFCRL 245
1	1	1	45	35	97.1	520	263	135	93.9	91.3	64.8	43.9	20.9	10.4
2	2	2	53	60	101.6	525	271	135	98.2	94.6	70.2	44.3	21.7	8.8
3	3	3	55	58	108.7*	525	279	144	105.1*	104.0	75.5	46.6	28.0	8.6
4	4	4	60	67	113.0*	525	279	145	109.3*	106.0	76.5	47.6	22.5	7.9
5	5	5	72	70	117.2	531	278	147	113.3	109.1	77.3	47.6	25.2	11.4
6	6	6	83	85	118.9	531	290	150	115.0	112.4	82.6	54.3	56.4	63.7
7	7	7	66	64	116.1	528	285	139	112.3	108.8	83.4	57.7	48.1	34.1
8	8	8	60	66	106.7	516	280	135	103.2	101.5	79.4	53.5	47.6	15.1
9	9	9	70	65	107.2	526	283	135	103.7	101.3	80.7	51.5	30.0	15.5
10	10	10	55	55	107.3	518	279	139	103.8	100.0	79.7	50.7	28.8	8.5
11	11	11	52	47	106.3	527	282	139	102.8	98.8	76.3	50.8	29.4	10.2
12	12	12	32	27	107.0	538	288	140	103.5	98.9	74.2	53.3	31.6	9.9
13	13	13	35	23	104.3*	528	289	142	100.9*	99.1	74.8	53.4	30.0	9.7
14	14	14	15	17	99.5	520	278	134	96.2	92.5	72.9	51.0	24.0	9.0
15	15	15	10	12	97.8	520	278	135	94.6	91.1	70.1	50.0	24.0	9.2
16	16	16	11	15	96.9	517	272	132	93.8	88.4	70.4	51.0	24.0	9.0
17	17	17	27	32	97.3	522	274	133	94.2	90.8	70.9	53.2	24.2	8.7
18	18	18	42	43	98.5	525	274	133	95.3	93.5	71.9	53.7	25.0	8.9
19	19	19	47	41	97.9	522	275	133	94.8	90.4	70.3	49.2	24.5	8.6
20	20	20	60	45	101.5	516	273	134	98.3	92.9	73.0	52.3	24.4	8.7
21	21	21	62	46	101.1	523	278	134	97.9	93.3	69.3	50.2	28.3	9.0
22	22	22	62	55	101.6	521	281	135	98.5	94.7	72.9	49.1	22.8	8.4
23	23	23	60	47	100.3	530	277	136	97.2	93.3	71.0	47.8	22.3	8.3
24	24	24	50	46	100.0	536	279	134	96.9	92.7	71.0	47.1	22.4	8.3
25	25	25	39	27	98.7	527	282	132	95.6	93.1	68.5	47.3	22.3	8.1
26	26	26	27	15	98.3	528	277	133	95.3	90.5	67.1	48.4	22.3	8.1
27	27	27	8	11	96.3	527	280	130	93.4	88.7	67.6	46.2	22.0	8.2
28	28	1	14	10	94.5	528	277	129	91.7	87.5	67.7	46.1	22.9	8.7
29	29	2	7	1	94.2	515	281	128	91.4	85.5	70.9	46.4	27.2	8.8
30	30	3	16	11	92.5	517	278	129	89.7	86.7	70.1	47.3	26.9	8.9
31	31	4	13	7	90.3	521	282	126	87.7	84.3	70.7	48.4	27.1	9.1
MEAN			42.2	38.8	102.2	524	279	136	99.0	95.3	72.0	49.7	27.6	11.9

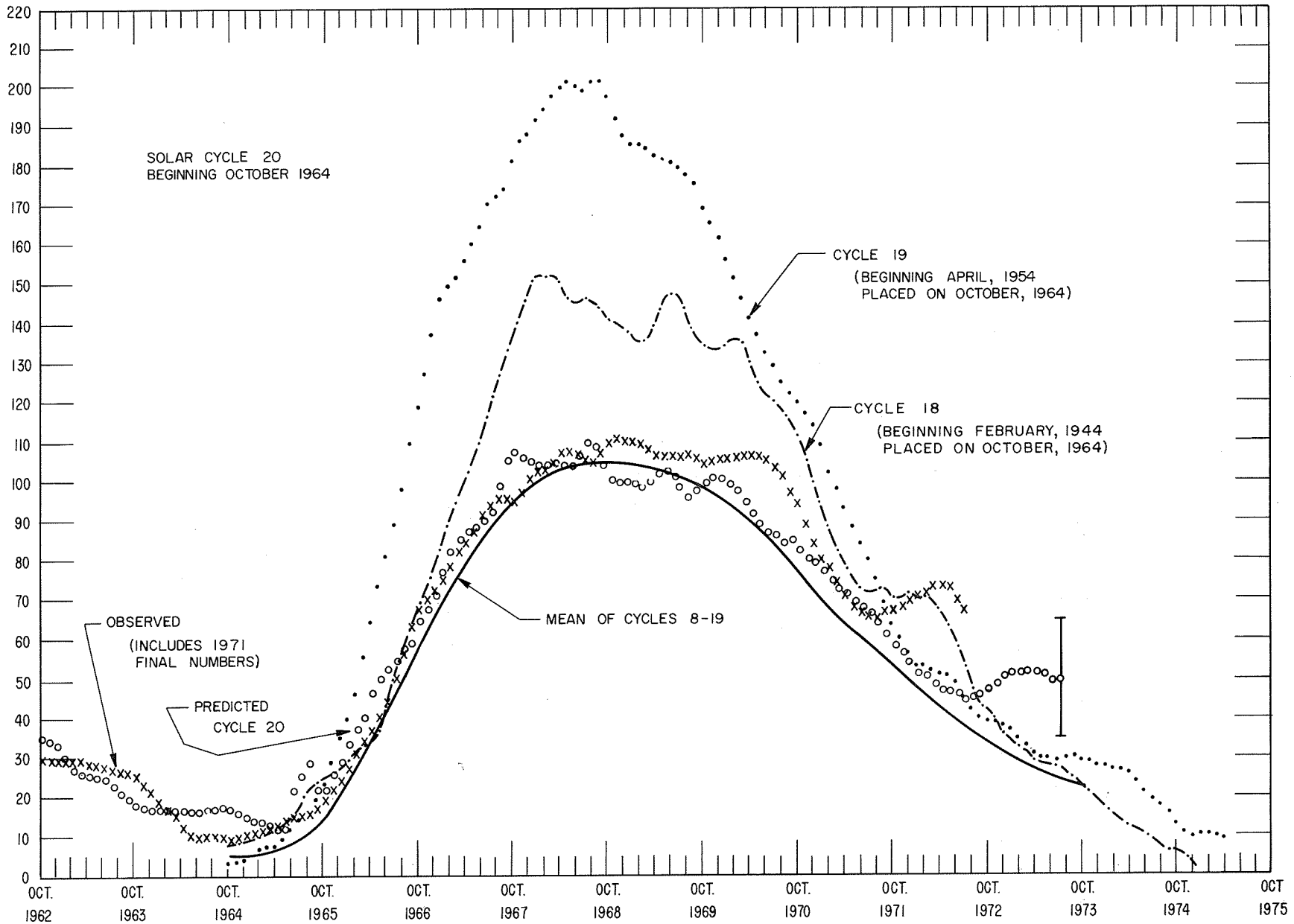
* Adjusted for burst

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 20

MONTH	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	10.2	11.0
1965	11.7	12.0	12.5	13.6	14.6	15.0	15.5	16.4	17.4	19.7	22.3	24.5
1966	27.7	31.3	34.5	37.4	40.7	44.6	50.3	56.6	63.1	67.6	70.2	72.7
1967	75.0	78.8	82.2	84.6	87.4	91.3	94.1	95.3	95.3	95.0	97.1	100.6
1968	102.6	102.9	104.7	107.2	107.6	106.6	105.2	104.8	107.0	109.9	110.6	110.1
1969	110.0	109.6	108.0	106.4	106.2	106.1	105.8	106.4	105.4	104.1	104.6	104.9
1970	105.6	106.0	106.2	106.1	105.8	105.3	103.8	101.0	97.2	93.9	89.4	84.1
1971	80.4	77.8	74.4	70.9	68.1	66.7	65.5	65.0	66.4	67.1	67.6	69.9
1972	71.2	71.6	72.6	73.2	72.3	69.5	67.0	64.7 (5)	64.2 (7)	64.6 (9)	63.9 (11)	62.7 (13)
1973	61.3 (13)	59.5 (13)	57.4 (13)	55.1 (14)	53.4 (15)	51.4 (15)	49.8 (15)	49.0 (16)	47.2 (17)	44.6 (18)	42.0 (17)	40.0 (17)
1974	38.5 (16)	37.2 (17)	36.2 (18)	35.2 (18)	34.5 (19)	33.3 (19)	31.7 (18)	29.8 (17)	27.6 (17)	25.5 (17)	23.3 (17)	21.8 (17)
1975	20.7 (16)	19.3 (15)										

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1971.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 19. Tests indicate that earlier cycles are from a different statistical population. From July 1968 - February 1970 a regression analysis based on cycles 1 through 19 was used because it had not then been proven that two populations exist.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SOLAR FLARES

PARTIAL LISTING

Solar Flares for which at least one observatory has assigned a numerical importance of "1" or greater.

JANUARY 1973

OBSERVATORY	OBSERVED UT DATE 1973 JAN	START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	DURATION MIN.	IMPORTANCE	OBS. COND.	TYPE	MEASUREMENTS TIME UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	REMARKS
MANI	03	0024	0042D	0032	N14	E56	.849		7.2	18D	SF	2		0032	.62	1.09			
MITK	03	0026	0049	0033	N14	E57	.858	12164	7.3	23	1N		C	0033	1.13	2.20			E
MITK	03	0115	0220	0135	S17	W90	1.000	12153	27.3	65	1N		C	0135	.72				DG
MITK	03	0238	0320	0240	S17	W90	1.000	12153	27.4	42	1N		C	0240	.83				DG
MITK	04	0312	0330	0318	N14	E47	.763		7.7	18	1N		C	0318	2.17	3.30			E
MANI	04	0318	0337	0324	N15	E48	.777		7.7	19	SN	1		0324	1.03	1.61			
CAPS	04	1255E	1324D		N04	E15	.287	12160	5.7	29D	1N	2	V	1256	2.50	2.60		(176)	C
CATA	04	1300	1335D	1300	N05	E15	.295	12160	5.7	35D	1B	2		1300	2.31	2.42		(209)	
MANI	05	2329E	2355	2329	N13	E20	.435	12164	7.5	26D	1F	1		2329	2.89	3.19			
TEHR	06	1017	1042	1022	S03	E49	.754		10.1	25	SN	2	C		1.09				F
CAPS	06	1019E	1042D		S03	E52	.787	12169	10.3	23D	1B		V	1022	1.70	2.90		(256)	C
ATHN	06	1026E	1033D	1029	S05	E55	.818		10.6	7D	SN	2	V		.66				F
CAPS	06	1310E	1435D		N12	E14	.357	12164	7.6	85D	1B	1	V	1356	2.20	2.30		(210)	
WEND	06	1350E	1500	1403	N13	E12	.349	12164	7.5	70D	2N		P	1200					
RAMY	06	1350	1425	1356	N13	E12	.349		7.5	35	1N	3	C		2.32				F
MCMA	06	1451E	1535D		N13	E12	.349	12164	7.5	44D	1N		C	1451	3.09	3.10			BF
WEND	06	1458	1515		N06	W11	.252	12160	5.8	17	1N		V	1300					
WEND	07	1052E	1115D		N12	E04	.279	12164	7.8	23D	1N		V	1300					
CAPS	07	1055E	1130D	1104	N11	E08	.288		8.1	35D	SB	3	V	1104	.90	.90		(275)	C
TEHR	07	1055E	1131	1104	N11	E04	.263		7.8	36D	SB	3	V		1.65				DE
TEHR	09	0447	0508	0458	N07	W52	.799	12160	5.3	21	1N	3	C		2.10				F
MITK	09	0452E	0501	0455	N11	W54	.827		5.2	9D	SN		C	0455	.93	1.50			E
MCMA	10	1913	2016D		N13	W44	.730	12164	7.5	63D	1N		P	1940	1.39	2.10			EK
RAMY	10	1917	1921D	1920	N13	W43	.719		7.6	4D	SF	2	C		.93				DE
PALE	10	1917	1943	1922	N13	W42	.708		7.7	26	SF	3	C		.72				F
MITK	11	0010	0027	0017	N11	W82	.992	12160	4.9	17	1F		C	0017	1.44				EH
PALE	11	0016	0028	0017	N08	W74	.965		5.5	12	SF	3	C		.27				
PALE	11	0036	0127	0045	N12	W77	.979	12160	5.2	51	1B	3	C		1.08				Z S
MITK	11	0036	0122	0048	N11	W82	.992	12160	4.9	46	1B		C	0048	1.86				H
MANI	11	0040E	0110D	0045	N09	W81	.990	12160	5.0	30D	1B	1		0045	1.24	3.25			
MITK	12	0450	0508	0455	N08	W70	.945	12164	7.0	18	1N		C	0455	1.75				
MITK	12	0506	0528	0513	N12	W65	.918	12164	7.3	22	1N		C	0513	1.13				D
MITK	12	0548	0603	0552	S15	E36	.602	12176	14.9	15	1B		C	0552	2.58	3.30			
MONT	12	1156	1230D	1202	N13	W72	.959	12164	7.1	34D	1B		C	1202	1.86				
RAMY	12	1158	1245	1203	N12	W65	.918		7.6	47	SB	2	V		1.03				DE
RAMY	12			1230							1N				2.27				DE
CATA	12	1200E	1200D	1200	N13	W74	.968	12164	6.9		1B	2		1200	1.44			(275)	
WEND	12	1203E	1249		N11	W71	.952	12164	7.2	46D	1N		P	1500					
ATHN	12	1207E	1243D	1207U	N12	W74	.967		7.0	36D	1N	2	C		.99				F
CATA	12	1210E	1330	1230	N13	W76	.976	12164	6.8	80D	3B	2		1230	4.63			(316)	
MCMA	12	1600	1614	1605	N12	W77	.979	12164	6.9	14	SN		C	1605					D
BOUL	12	1610	1620	1611	N12	W74	.967		7.1	10	1F	2	V						
BOUL	12	1633	1704	1634	N12	W74	.967		7.1	31	1F	1	V						
MCMA	12	1635	1705	1650	N12	W77	.979	12164	6.9	30	SN		C	1650					E
RAMY	12	1641	1659	1643	N11	W75	.971		7.1	18	SN	4	V		.28				DE
MCMA	12	1710	1721	1713	N12	W77	.979	12164	6.9	11	SN		C	1713					D
BOUL	12	1713	1726	1715	N12	W74	.967		7.2	13	1F	2	V						
PALE	12	1814	1838	1822	S12	E75	.963	12186	18.4	24	1N	3	C		1.27				UDE
MITK	13	0305	0400D	0314	N08	W78	.981	12164	7.3	55D	1N		C	0314	1.86				
MITK	14	0103	0117	0107	N13	W90	1.000	12164	7.3	14	1N		C	0107	1.03				D
MITK	25	0354E	0416D	0358	S01	E90	1.000	12205	31.9	22D	1N		C	0358	1.03				G
RAMY	28	1254	1330	1300	N10	E45	.737		31.9	36	SN	3	C		1.39				F
CAPS	28	1302E	1315D		N09	E50	.788	12205	1.3	13D	1N	2	S	1305	2.00	3.40		(196)	

"Remarks":
A = Eruptive prominence, base at >90°
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No spots visible in the neighborhood.
H = Flare with high velocity dark surge.
I = Very extensive active region.
J = Plage with flare shows marked intensity variations.
K = Several intensity maxima.
L = Filaments show effects of sudden activation.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H or K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line.
S = Brightening follows disappearance of filament (same position).
T = Region active all day.
U = Close and somewhat parallel bright filaments (|| or Y shape).
V = Occurrence of an explosive phase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα emission.
Y = Onset of a system of loop-type prominences.
Z = Major sunspot umbra covered by flare.

Note: Catania and Capri-S express Maximum Intensities in percent of the local undisturbed chromosphere instead of percent of the local continuum. Parentheses are used to indicate this difference.

SOLAR FLARES

Date, time (UT) and coordinates of Subflares not included in preceding table.

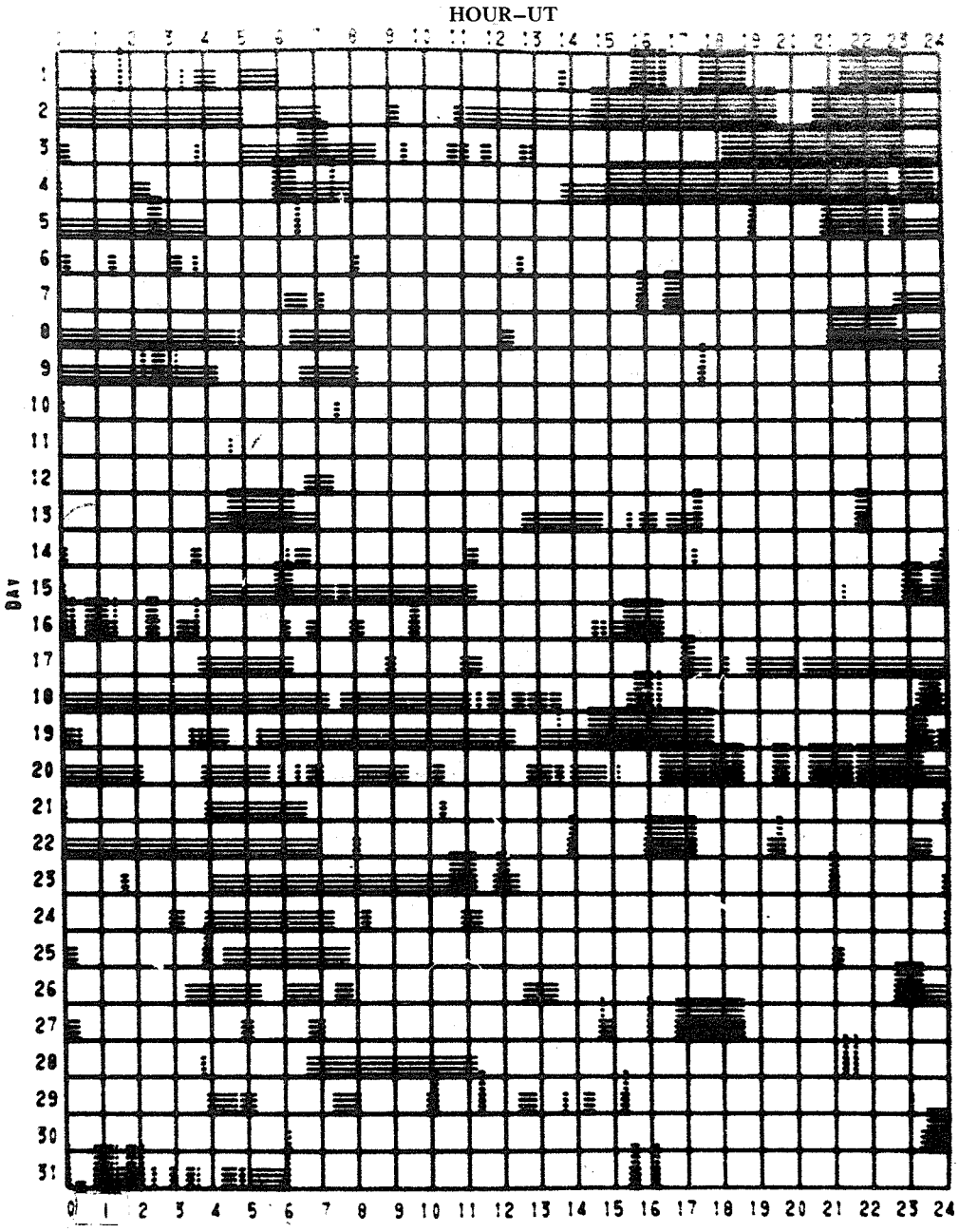
JANUARY 1973

01	0035	S11	E30	01	0837E	N06	E67	01	0837	S04	E65	01	0838E	N05	E65	01	0845	S17	W02	01	0852	N06	E67
01	0853	S04	E65	01	0915E	N06	E55	01	1207E	S04	E63	01	1619E	N06	E61	01	1800	N14	E79	01	1804	N13	E72
02	0350	N06	E49	02	0800E	N13	E65	02	1157	N06	E44	02	1644	S17	W88	02	1958	S17	W90	03	0845	S16	W05
03	1423	N15	E50	03	1540	N15	E50	03	1542	S17	W08	03	1630	N15	E49	03	1801	N15	E52	04	0639	N15	E45
05	0010	N13	E28	05	0033	N14	E36	05	0833	N07	W01	05	0935E	N06	W02	05	0940	N07	W03	05	1125	N13	E29
05	1200E	N14	E27	05	1209	N13	E29	05	1238	N14	E28	05	1241E	N13	E27	05	1252	N14	E28	05	1254E	N14	E26
05	1350	N11	W04	05	1502	N13	E28	05	1514E	N03	E07	05	1607E	N15	E26	05	1749	N08	W05	05	1757	N18	E27
05	1816E	N12	E29	05	1939	N12	E29	05	2007	N08	W08	05	2009E	N07	W09	05	2312E	N14	E22	05	2329E	N08	W04
06	0019	S13	W12	06	0020	S13	W13	06	0031	N16	W66	06	0230	N17	W68	06	0332	N12	E17	06	0434	N12	E02
06	0604	N13	E15	06	1221E	S13	W47	06	1251	N12	E12	06	1255E	N12	E12	06	1504	N03	W14	06	1535	N12	W18
06	1553	N13	E12	06	1801	S16	W51	06	1820	N05	W17	06	1919	N10	W20	06	1922E	N10	W20	06	2114	N07	W16
07	0650E	N13	E05	07	0653	N11	E05	07	1213	N10	W26	07	1508	N12	E02	07	1510E	N11	E04	07	1541	N13	W06
07	1920	S18	W66	07	2232	N12	W00	07	2235E	N13	W02	08	0125	N10	W40	08	0130	N13	W05	08	0710E	N09	W31
08	1039	N13	W04	08	1040	N14	W05	08	1335E	N06	W45	08	1817	N06	W52	08	1949	N09	W84	08	1950E	N07	W45
08	2022	N07	W48	08	2303E	N08	W48	09	0354	S12	W87	09	0808E	N17	W57	09	0913	N09	W58	09	1049	S09	W84
10	0431	N12	W66	10	0608E	N12	W66	10	0608E	N12	W66	10	0640	N11	W68	10	0840E	N10	W72	10	0940E	N10	W73
10	0944	N09	W71	10	1315E	N10	W73	10	1612	N08	W75	10	1756	N13	W67	10	1809	N08	W90	10	2118	N07	W71
10	2135	N09	W71	10	2137	N12	W67	11	0145E	N10	W72	11	0556E	S15	E48	11	1131	N15	W52	11	1133E	N14	W53
11	1133	N15	W53	11	1517	N12	W60	11	1717E	N10	W90	11	1741E	N13	W57	11	1853E	N12	W61	11	1858E	N12	W63
11	2133	N13	W64	11	2317	N13	W65	12	0820E	N14	W67	12	0824	N15	W66	12	1015	N12	W72	12	1111	S15	E33
12	1737	N14	W70	12	1810	N12	W79	12	1939	N13	W79	12	2003E	N14	W69	12	2003	N13	W69	12	2008	N09	E90
12	2009	N09	E90	12	2134E	S04	W35	12	2134E	S05	W37	13	0938	N14	W79	13	2021	N13	W85	13	2021	N15	W82
14	2006	N14	E64	14	2008	N14	E65	14	2009E	N17	E65	14	2107	N16	E60	15	0212	S18	E40	15	0320	N08	E61
15	1128	N14	E66	16	1812E	N09	E34	16	1816	N07	E36	16	1845	N07	E36	16	1914	N07	E36	16	2038	N09	E33
17	0634	S18	W20	17	1152E	S12	E19	18	0158E	S13	E13	18	0235	N09	E19	18	0243E	N10	E20	18	0244E	N09	E20
18	1031E	S12	E07	18	1225	N11	E16	18	1955	S18	E35	19	0157	S13	W02	19	0404	S13	W02	19	0945E	N12	E04
19	1921	S12	W11	19	2136	N11	W03	19	2137	N12	W01	19	2138	S13	W14	20	0257	N10	W07	20	1025E	N12	W60
20	1120	S15	W64	20	1120	N10	W12	20	1200	S15	W65	21	0154	N06	E86	21	0155	N06	E85	21	0350	S17	W77
21	0454	S17	W78	21	1149	N12	E49	21	1801	N13	W30	22	0229E	S11	E48	22	0238E	N11	E46	22	0629E	N11	W38
22	0830E	S14	W49	22	0830E	S18	W48	22	0845	S14	W47	22	1420	N04	W43	23	0109	S14	W57	23	1148E	S14	W64
23	1449	N10	E22	23	1651	N10	W54	24	0647	N10	W62	24	0825	N09	W64	24	1414	N12	E05	24	1610	S16	W78
24	1613	S14	W77	24	2023	N10	E00	24	2025	N09	E04	24	2025	N10	E02	24	2026E	N11	W01	25	0836	N20	E36
25	0842E	N20	E35	25	0855E	N20	E34	25	0938	N09	E90	25	0941	N05	E90	25	0945E	N10	E90	25	0951E	N10	E90
25	1246	N08	W01	25	1247E	N09	W01	25	1250E	N10	E03	25	1720	S10	E31	25	1720	S10	E28	25	1739	S11	E30
25	2105E	S11	E28	25	2106E	S09	E27	25	2106E	S09	E27	25	2115E	S09	E27	26	0056	N11	W13	26	0213	N11	W13
26	0213	N10	W14	26	0214	N09	W15	26	1217	N10	W12	26	1223	N11	W13	26	1402	N08	W15	26	1615	S10	E15
26	1620	S10	E14	27	0612E	N70	E12	27	0749E	S17	W50	27	0927	N10	E69	27	1116	N17	E07	27	1120	N18	E07
28	1012E	N19	W06	28	1023E	N18	W08	28	1257	N11	W46	28	1833	N10	E44	30	0247E	N12	E27	30	1240E	N09	W75
30	1305	N04	E44	30	1310	N01	E44	30	1734	N07	W77	30	2136	N04	E41	31	1453E	N12	E07	31	1901	S04	E88
31	2032	N11	E05	31	2047	S08	E84	31	2048	S04	E87	31	2218	S08	E83								

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JANUARY 1973



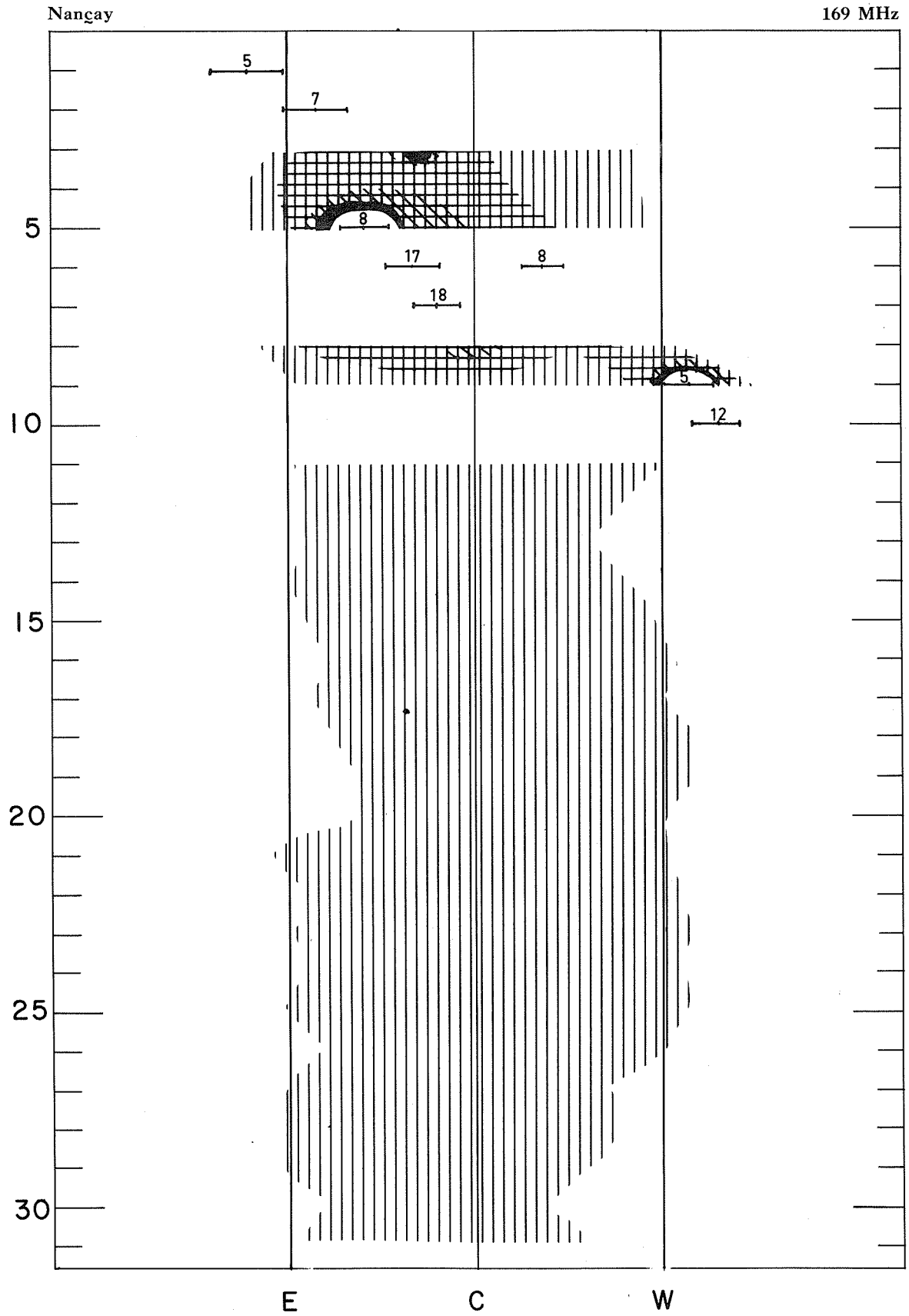
Observatories included in total patrol:

Arcetri	Catania	McMath-Hulbert	Ramey
Athenes	Herstmonceux	Mitaka	Tehran
Boulder	Istanboul	Monte Mario	Upice
Bucharest	Kodaikanal	Ondrejov	Wendelstein
Capri-S (Swedish)	Manila	Palehua	

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

JANUARY 1973

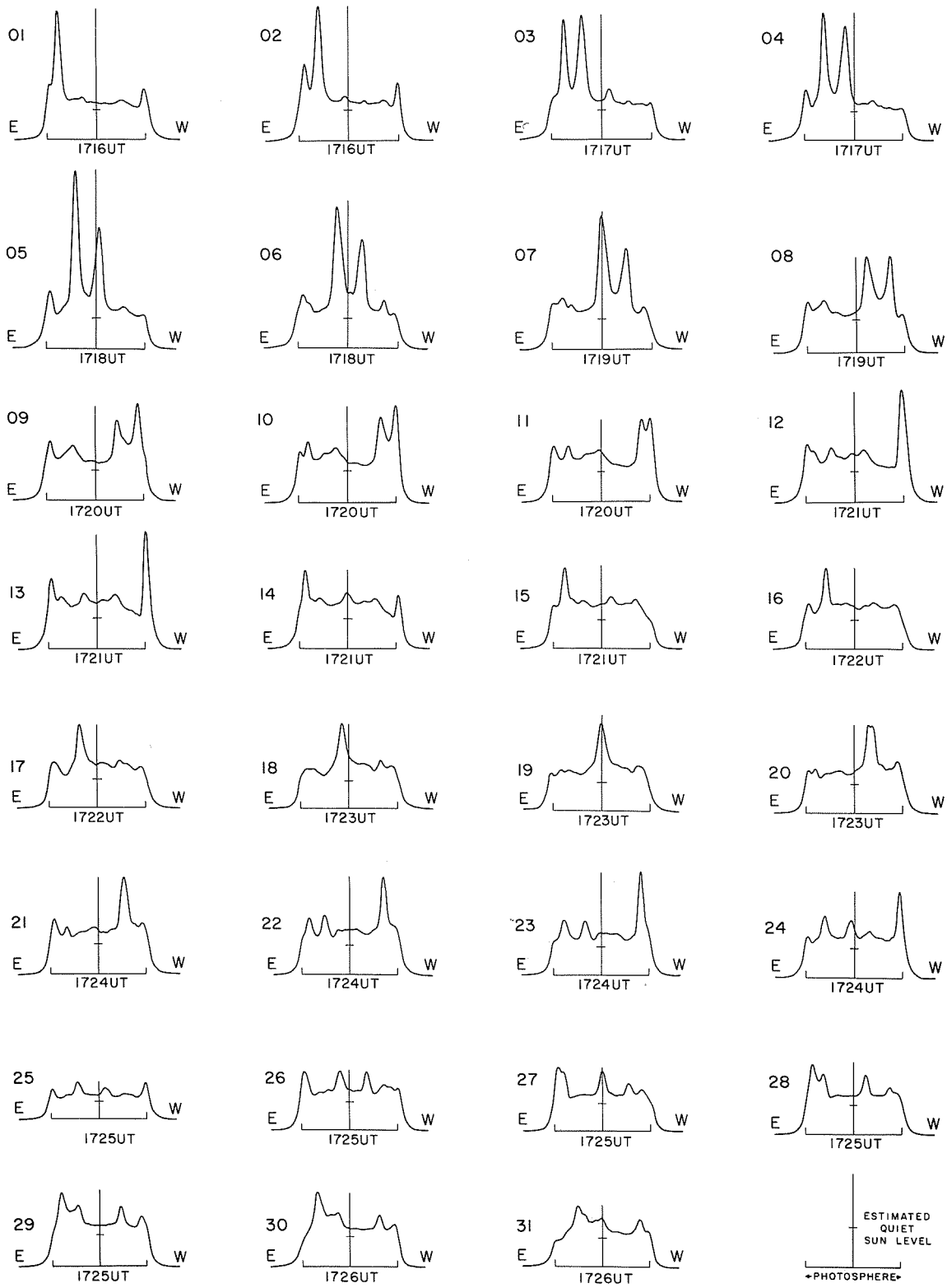


EAST-WEST SOLAR SCANS

January 1973

ALGONQUIN RADIO OBSERVATORY
CANADA

Fan-Beam with 1.5 minutes of arc
E-W Resolution

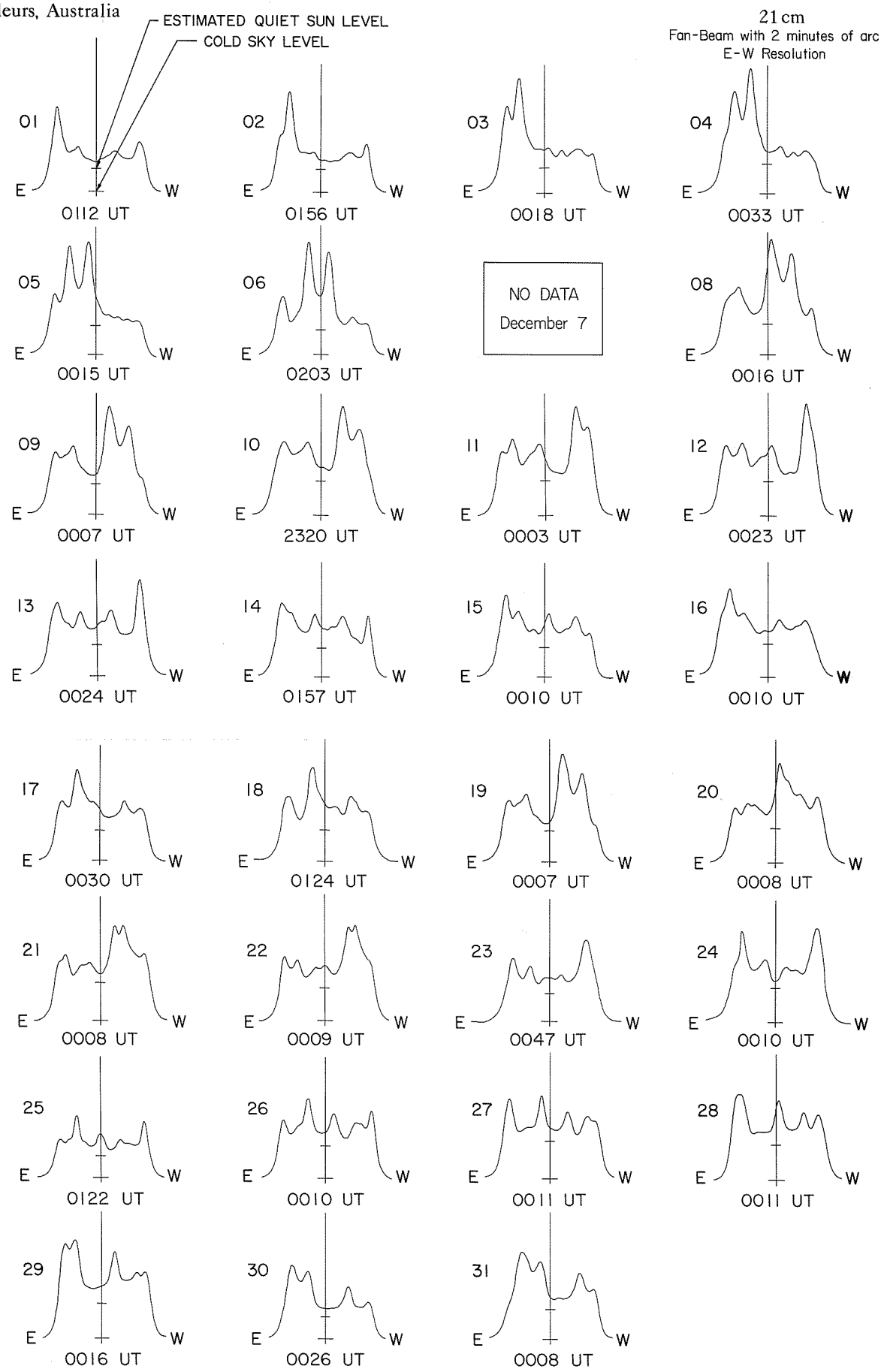


EAST-WEST SOLAR SCANS

JANUARY 1973

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution

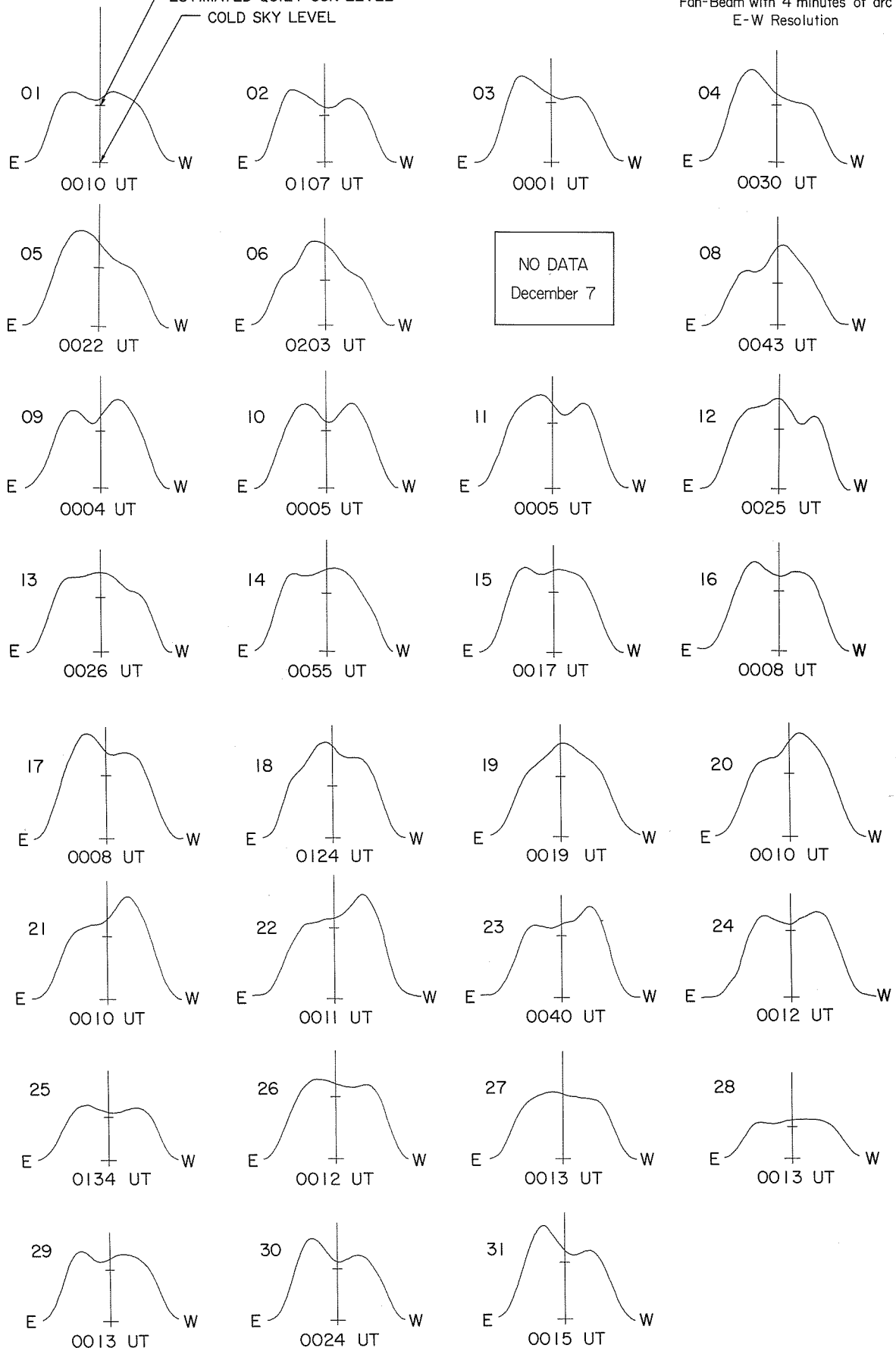


EAST-WEST SOLAR SCANS

JANUARY 1973

Fleurs, Australia

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JANUARY 1973

JAN. 1973	FREQUENCY STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	REMARKS
1	2800 OTTA	20	1430	1440	100	1.4	0.7		
3	2695 CANR	3	1242.5	1243.5	3	3.0	1.0		
	2800 OTTA	25	1420		7	2.0			
	2800 OTTA	2	1423.5	1424	.7	1.4	0.7		
	2800 OTTA	21	1535	1547.5	90	4.8	2.4		
	2695 SGMR	1	1544.2	1547.2	7.6	5.8	.8		
	8800 SGMR	3	1546.8	1547.5	1.5	11.0	3.9		
	2695 BOUL	3	1547.5	1548	1	3.0	1.0		
	2800 OTTA	1	1547	1547.5	1.5	3.8	1.9		
	2695 CANR	3	1629	1631	5	10.0	3.0		
	2800 OTTA	1	1629.5	1632	6	9.0	3.2		
	2695 SGMR	3	1629.4	1632 U	4.6U	11.3U	U		
	2695 BOUL	3	1630	1632.5	7	12.0	4.0		
	8800 SGMR	1	1630 U	1632 U	3.4U	5.8U	U		
	2695 CANR	21	1643	1647	20.5	8.0	2.0		
	2800 OTTA	21	1742	1806	130	7.0	3.5		
	2695 SGMR	3	1758.2	1801.3	10.5	26.1	8.7		
	2800 OTTA	3	1759	1801	5	24.0	9.0		
	8800 SGMR	3	1759.5	1800.5	11.1	31.0	10.3		
	2695 BOUL	3	1800	1801.5	5.5	24.0	11.0		
	2695 SGMR	29	1808.7	1808.7	15.9	2.6	1.3		
	2800 OTTA	20	1833	1839	40	4.6	2.3		
	2695 SGMR	22	1833.7	1840.2	25.3	4.5	2.3		
	2695 PENT	20	2100	2113	40	2.2	1.1U		
4	2695 CRON	45	0641.5	0643.5	15.5	8.0	2.0		
	2695 MANI	20	0643	0644.5	10.5	9.2	2.6		
	2695 SGMR	1	1255.3	1257.4	4.6	7.5	3.0		
	2800 OTTA	22	1610	1640	70	2.0	1.2		
	2695 SGMR	20	2027.8	2030.2	13.1	8.0	4.0		
	2800 OTTA	20	2028	2030	55	7.4	3.5		
	2695 BOUL	21	2029	2030.5	11.5	7.0	2.0		
	8800 SGMR	1	2029.5	2030.3	5.5	3.8	1.9		
5	2695 CANR	8	0846.5	0847	1.5	6.0	2.0		
	2800 OTTA	1	1353	1353.2	.5	2.0	1.0		
	2800 OTTA	21	1455	1605	110	3.2	2.0		
	2695 CANR	8	1512.5	1514	2	13.0	6.0		
	8800 SGMR	46	1512.8	1515.2	10.6	13.9	8.4		
	8800 SGMR	46		1520.2		33.6			
	2800 OTTA	3	1513.5	1515	3	12.4	3.1		
	2695 SGMR	46	1513.6	1514.9	15.5	10.4	3.0		
	2695 SGMR	46		1520.1		12.0			
	2695 BOUL	8	1514	1514.5	2	9.0	4.0		
	2695 CANR	3	1518.5	1519.5	6.5	16.0	5.0		
	2800 OTTA	3	1519	1520	3	13.4	9.0		
	2695 BOUL	3	1520	1520.5	2	11.0	4.0		
	2800 OTTA	29	1522		9	4.2	2.0		
	2695 CANR	8	1540	1540.5	4	8.0	3.0		
	2695 BOUL	3	1540.5	1541	1.5	7.0	2.0		
	2800 OTTA	1	1540.6	1541.2	3	5.2	1.8		
	2695 SGMR	1	1540.2	1541.1	3.7	5.7	2.0		
	2695 PENT	20	2145	2149	25	3.8	1.9U		
6	2800 OTTA	23	1340 E	1355	190 D	22.0			
	2695 CANR	21	1349	1355	34	11.0	3.0		
	2695 CANR	3	1501.5	1503	4	5.0	2.0		
	2800 OTTA	1	1503	1504	4	3.2	1.6		
	2695 SGMR	1	1503.1	1503.8	4.8	3.2	1.0		
	2800 OTTA	20	1705	1840	240	7.6	3.8		
7	2695 CRON	8	0646	0647	1.5	9.0	3.0		
	8800 MANI	3	0647.7	0648.2	6.2	13.8	5.9		
	2695 MANI	1	0647.3	0648	6.6	6.0	2.4		
	2695 CANR	3	0901	0902	1.5	5.0	2.0		
	2695 CANR	8	1508	1508.5	3.5	14.0	6.0		
	2800 OTTA	3	1508.5	1508.9	3	14.4	3.8		
	8800 SGMR	3	1508.3	1509.1	3.2	20.5	9.2		
	2695 SGMR	3	1508.4	1508.9	3.9	12.1	4.6		
	2695 BOUL	8	1509.5	1510	1	13.0	4.0		
	2800 OTTA	24	1552		13	2.4			
	2800 OTTA	26	2000		35	2.4			
	2695 CRON	3	2232.5	2233.5	2.5	10.0	4.0		
	2695 BOUL	45	2232.5	2233	9	9.0	2.0		
	2800 OTTA	1	2232.2	2232.5	2.5	6.0	3.0		
8	2695 MANI	1	0109	0109.2	1.2	2.6	1.3		
	2800 OTTA	20	1445	1518	120	2.6	1.8		
	2800 OTTA	20	1920	1955	110	1.6	0.8		
9	2695 CRON	45	0449	0450	6	11.0	3.0		
	8800 MANI	4	0449.8	0450.7	9.6	34.2	10.7		
	2695 MANI	4	0449.8	0450.7	9.9	13.2	3.6		
	2800 OTTA	1	2047	2048.5	2	8.0	4.0		
	2695 SGMR	2	2047.2	2048.5	2.6	7.4	2.5		
	2800 OTTA	29	2049		35	2.8	1.0		
	2695 BOUL	3	2247.5	2249	2	10.0	3.0		
10	2800 OTTA	1	1521	1522	2	.8	0.4		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JANUARY 1973

JAN. 1973	FREQUENCY STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY $10^{-22} Wm^{-2} Hz^{-1}$ PEAK	MEAN	INT	REMARKS
	2695 BOUL	3	1715.5	1717	2.5	6.0	2.0		
	2695 BOUL	45	1801.5	1804.5	16.5	47.0	12.0		
	2695 BOUL	45	1859.5	1900.5	2	11.0	3.0		
	2800 OTTA	21	1905	1930	180	3.4	2.0		
	2800 OTTA	1	2113	2113.5	2	1.2	0.6		
	2695 BOUL	45	2132.5	2133.5	1.5	10.0	3.0		
11	2695 CRON	45	0035	0047.5	35	58.0	15.0		
	2695 MANI	22	0036.8	0048.4	25	50.0	12.2		
	8800 MANI	47	0043.6	0049.3	22.1	810.0	186.0		
	2800 OTTA	1	1637	1637.5	1	1.0	0.5		
	2800 OTTA	2	1715.5	1716.5	2.5	4.4	2.2		
	2695 SGMR	1	1715.4	1716.6	3.6	5.0	2.5		
	8800 SGMR	21	1755	1805.6	41.1	13.4	6.0		
	2695 SGMR	21	1755.8	1807	29.6	7.0	3.0		
	2800 OTTA	46	1800.5	1809	15	33.0	13.1		
	2800 OTTA	46	1800.5	1803.5	6.5	27.8			
	2800 OTTA	46	1807	1809	3.5	33.0			
	2800 OTTA	46	1810.5	1811.9	5	24.0			
	2695 SGMR	46	1800.6	1802.3	5.9	17.8	10.0		
	2695 SGMR	46		1803.6		36.6			
	2695 SGMR	46		1805.5		18.0			
	8800 SGMR	4	1801.7	1803.6	3	21.0	9.0		
	8800 SGMR	4	1805.6	1809.2	9.4	360.0	100.0		
	2695 SGMR	46	1807.3	1809.1	7.4	21.8	7.0		
	2695 SGMR	46		1811.8		14.0			
	2800 OTTA	29	1815.5		12	2.0	0.7		
	2695 SGMR	1	1857.8	1900	3.6	6.8	3.4		
	2800 OTTA	2	1858.9	1900	2.5	8.0	2.0		
	8800 SGMR	1	1859.3	1900.1	2.2	2.5	1.2		
	2695 PENT	45	2131.9	2132.6	2	7.8	3.9U		
12	2695 CANR	3	1139.5	1140	1	4.0	1.0		
	2695 CANR	3	1153	1153.5	1	3.0	1.0		
	2695 CANR	3	1157.5	1158.5	1.5	7.0	2.0		
	2695 CANR	3	1208.5	1210	5	12.0	5.0		
	2800 OTTA	21	1715	1828	160	2.8	1.4		
	2800 OTTA	1	1743	1744	2	1.0	0.5		
	2695 SGMR	20	1820	1828.9	20.6	3.4	1.7		
	8800 SGMR	20	1821.7	1825.7	13.3	7.3	3.6		
	2800 OTTA	1	1938.5	1939.5	2.5	1.4	0.7		
13	2800 OTTA	20	1335	1410	115	4.2	2.3		
	2800 OTTA	20	1542	1750	220	4.2	2.1		
15	2695 BOUL	3	2301	2302	1.5	7.0	3.0		
18	2695 CANR	3	0822	0823	2	5.0	2.0		
19	2695 CRON	45	1040	1041.5	3.5	13.0	5.0		
	2695 BOUL	3	2135.5	2136.5	1.5	4.0	1.0		
	2800 OTTA	1	2135	2135.7	1.2	1.6	0.8		
20	2695 CANR	3	1111	1112	2	2.0	1.0		
21	2695 CANR	45	0806	0807	2.5	8.0	3.0		
	2695 CANR	3	0830	0832.5	3.5	3.0	1.0		
	2695 SGMR	1	1859.9	1900	.3	6.6	3.3		
22	2695 CRON	3	0529.5	0530	1.5	6.0	2.0		
	2695 BOUL	8	2330.5	2331	1	7.0	3.0		
23	2800 OTTA	20	1400	1430	115	2.0	1.0		
24	2695 CRON	3	0642	0643	1.5	4.0	1.0		
25	2800 OTTA	2	2103	2105	3	2.0	0.9		
	2695 BOUL	3	2104	2105.5	2	5.0	2.0		
29	2695 CANR	3	1819	1820	1.5	7.0	2.0		
30	2695 CANR	3	0805.5	0806.5	1.5	5.0	2.0		
	2695 CANR	3	0811.5	0813.5	3	6.0	2.0		
	2695 CANR	3	1809.5	1811	2.5	5.0	2.0		
31	2695 CANR	21	0915	0916	6.5	4.0	1.0		
	2695 SGMR	1	1508.7	1508.8	1.9	4.0	1.9		

Observatories:

BOUL = Boulder
CANR = Canary Islands
CRON = Carnarvon
MANI = Manila
OTTA = Ottawa ARO
PENT = Penticton
SGMR = Sagamore Hill

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

PIONEER VI

JANUARY 1973

Date Jan. 1973	Time (UT)	ESP (°)	Solar Wind[1]		Cosmic Ray Protons[2] (particles/sec)		
			U_H+ (km/sec)	TAU (Days)	0.6-13 Mev*	13-175 Mev**	>175 Mev
21	1424	-071.8	448	-4.919	0.334	Q	Q

PIONEER VII

JANUARY 1973

Date Jan. 1973	Time (UT)	ESP (°)	Solar Wind[1]		Cosmic Ray Protons[2] (particles/sec)		
			U_H+ (km/sec)	TAU (Days)	0.6-13 Mev*	13-175 Mev**	>175 Mev
21	1617	-135.27	500	-10.2787	--	--	--

1 Wolfe - NASA/ARC
2 Simpson - University of Chicago

* Includes He 0.6-13 Mev/nucleons and electrons ∿0.5 Mev - see J. Retzler and J. A. Simpson, J. Geophys. Res., 74, 9, 2149-2160, 1969 for discussion of the electron response of Pioneer VII.
** Includes He >13 Mev/nucleons.
Q used to indicate that a rate is at its quiescent level.

Note: The notes published with the March 1972 data continue to apply to the current data.

ESP = Earth-Sun Probe Angle.

PIONEER VIII

JANUARY 1973

Date Jan. 1973	Time (UT)	ESP (°)	Solar Wind[1]		IP E-Field[2]	IP Magnetic Field[3]			Cosmic Ray Protons[4] (particles/sec)	
			U_H+ (km/sec)	TAU (Days)	400 Hz (mv)	/B/ (Gamma)	ϕ (°)	Condition	>13.9 Mev	>64 Mev
22	0200	112.5	390	8.2928	0.455	8.1	322	very quiet	7.01	1.26

1 Wolfe - NASA/ARC
2 Scarfe - TRW, Inc.
3 Ness - NASA/Goddard & Mariani - Univ. of Roma
4 Webber - Univ. of N.H.

ESP = Earth-Sun Probe Angle.

PIONEER IX

JANUARY 1973

Date Jan. 1973	Time (UT)	ESP (°)	Solar Wind[1] U_{H^+} (km/sec)	Solar Wind[1] TAU (Days)	IP E-Field[2] 400 Hz (mv)	IP Magnetic Field[3] /B/ (Gamma)	IP Magnetic Field[3] ϕ (°)	IP Magnetic Field[3] Condition	Cosmic Ray Protons[4] (particles/sec) >13.9 Mev	Cosmic Ray Protons[4] (particles/sec) >40 Mev
2	2000		293		0.231				6.21	1.21
3	0000	029.65	303	2.2739	0.217	5.0	355	quiet (1)	6.08	1.14
	0400		325		0.214				5.90	1.09
	1900		363		0.179				6.14	1.12
	2300		350		0.225	6.4	343	disturbed	6.35	1.29
4	0300	029.71	350	2.2772	0.171				6.20	1.17
	1400		376		0.198	5.4	038	disturbed	6.31	1.31
	1800		376		0.234				6.41	1.20
6	0000	029.82	404	2.4145	0.226	3.1	147	very disturbed	6.49	1.14
	0400		404		0.206				6.64	1.29
10	0000	029.96	630	2.2921	0.206	7.6	145	quiet	6.42	1.63
	0400		630		0.278				6.06	0.89
	1300		630		0.251				6.14	1.06
	1700		630		0.258	3.7	157	very quiet	6.24	0.97
	2100		608		0.306				6.22	1.12
12	0200	030.04	504	2.3189	0.307	3.5	126	very quiet	6.35	1.19
	1300		504		0.261				6.37	1.24
	1700		468		0.290	4.7	116	quiet	6.23	1.29
	2100		468		0.272				6.33	1.16
13	1000	030.08	449	2.3354	0.171				6.39	1.39
	1400		449		0.217	5.5	133	quiet (2)	6.33	1.21
	1800		449		0.179				6.42	1.30
14	1000	030.11	404	2.1637	0.163				6.38	1.26
	1400		417		0.191	5.6	139	very quiet	6.51	1.28
	1800		404		0.171				6.47	1.23
16	0500	030.17	350	2.1377	0.206	6.1	103	very quiet	6.30	1.23
	1300		325		0.216				6.54	1.09
	1700		325		0.245	6.2	158	quiet	6.53	1.11
	2100		338		0.214				6.52	1.26
17	2100		376		0.226	8.6	337	very quiet(3)	6.22	1.06
18	0100	030.21	449	2.3761	0.222			disturbed (4)	6.23	1.26
	1000		449		0.155				6.34	1.14
	1400		449		0.148	7.1	343	quiet (5)	6.18	1.21
	1800		430		0.171				6.38	1.15
19	1000	030.23	430	2.3891	0.171				6.35	1.14
	1400		449		0.203	4.8	297	very quiet	6.10	1.16
	1800		404		0.206				6.23	1.10
21	1000	030.25	404	2.4037	0.233				6.05	1.21
	1400		404		0.215	17.4	310	very quiet	5.9	1.19
	1800		430		0.203				6.1	1.13
26	1000	030.24	564	2.4063	0.258				5.95	1.14
	1400		542		0.267	6.0	004	very quiet	6.0	1.10
	1800		504		0.269				6.08	1.04
27	1000	030.22	504	2.4283	0.261				6.16	1.27
	1400		486		0.206	3.3	192	quiet (6)	6.04	1.13
	1800		468		0.187				6.14	1.17
28	1000	030.20	449	2.4481	0.164				6.15	1.09
	1400		404		0.187	4.4	323	disturbed (7)	6.17	.98
	1800		449		0.171			quiet (8)	6.11	1.19

[1] Wolfe - NASA/ARC
[2] Scarfe - TRW, Inc.
[3] Sonett and Colburn - NASA/ARC
[4] Webber - Univ. of N.H.

ESP = Earth-Sun Probe Angle.

Notes:
1 With one Field Reversal at 0227 UT
2 With one Field Direction Reversal at 1903 UT
3 Very quiet and inward 1925 thru 0130 UT
4 0136 UT thru 0230 UT
5 With three Field Direction Reversals at 0953, 1015 and 1018 UT
6 With three Field Direction Reversals at 1035, 1740 and 1910 UT
7 1000 thru 1300 UT
8 1300 thru 1920 UT

Note: Possible Pioneer 9/10 Spiral Alignment Occurrences at various Nominal Solar Wind Velocities:

U_{H+}(km/sec)	Date (of Alignment)
300	15 February 1973
400	27 December 1972
500	09 November 1972

DECEMBER 1972 DATA

Contents

	Page
Daily Solar Activity Centers	
X-ray, 8.6 mm, 9.1 cm and 21 cm Spectroheliograms, Magnetograms, Calcium Plages, Hα Spectroheliograms, Sunspots, Corona and EUV Spectroheliograms	22-83
Individual Regions of Solar Activity	84-89
Daily Calcium Indices	89
Solar X-ray Radiation	
Naval Research Laboratory - Explorer 44	90-92
Sudden Ionospheric Disturbances	
Table of Events	93
Number of Events in each Plage Region	94
Solar Radio Waves	
Spectral Observations	95-100
Selected Events by Radioheliograph	101
Cosmic Rays	
Neutron Monitors Daily Values - Calgary, Sulphur Mountain, Dallas	102
Chart of Variations - Calgary, Sulphur Mountain	103
Geomagnetic Indices	
Table of Indices Kp, Ci, Cp, Ap	104
12-Month Table of Daily Average Ap	105
Chart of Kp by Solar Rotations	106
Chart of C9 by Solar Rotations	107
Principal Magnetic Storms	108
Sudden Commencements and Solar Flare Effects	109
Radio Propagation Indices	
North Atlantic Quality Figures and Forecasts	110
Charts of North Atlantic Short-term Forecasts and Quality and High Latitude Advance Forecasts	111
Transmission Frequency Ranges - North Atlantic Path	112-113
Quality Indices on Germany-Canada Path	114

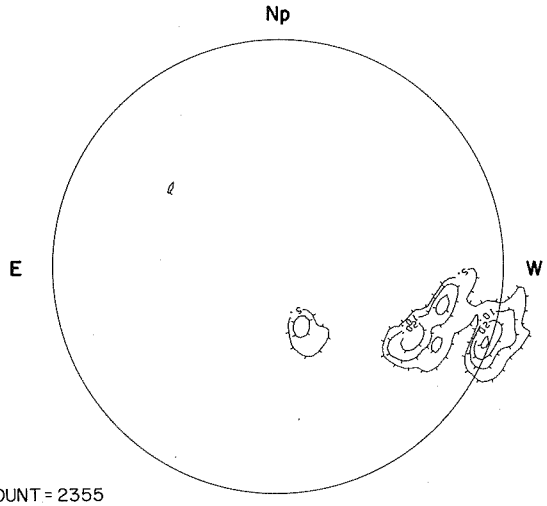
For explanations of the data contained herein see "Descriptive Text" published as supplement to February 1973 "Solar-Geophysical Data" (Number 342).

DECEMBER 1, 1972 (P = 16.08 B_o = 0.82 L_o = 249.72

22
Dec 72

NASA GSFC
OSO-7

X-RAY



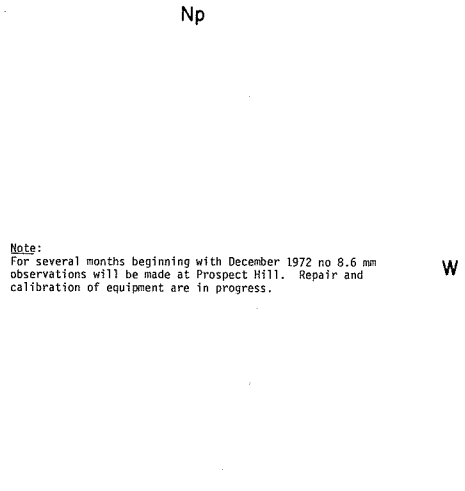
COUNT = 2355
ROLL = 106.5°
P-TH = 7.20

0144 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

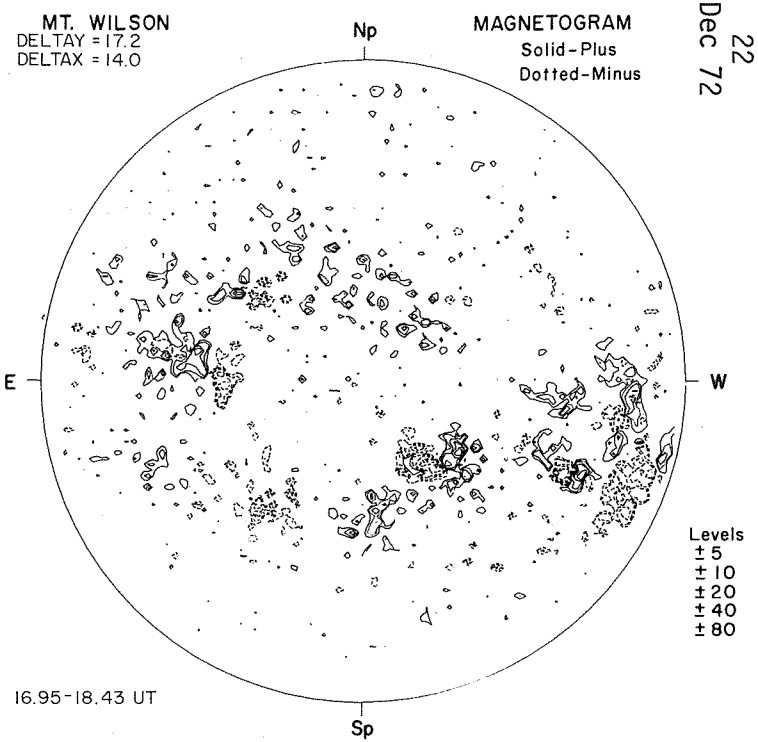


Note:
For several months beginning with December 1972 no 8.6 mm observations will be made at Prospect Hill. Repair and calibration of equipment are in progress.

Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.2
DELTAX = 14.0

MAGNETOGRAM
Solid-Plus
Dotted-Minus

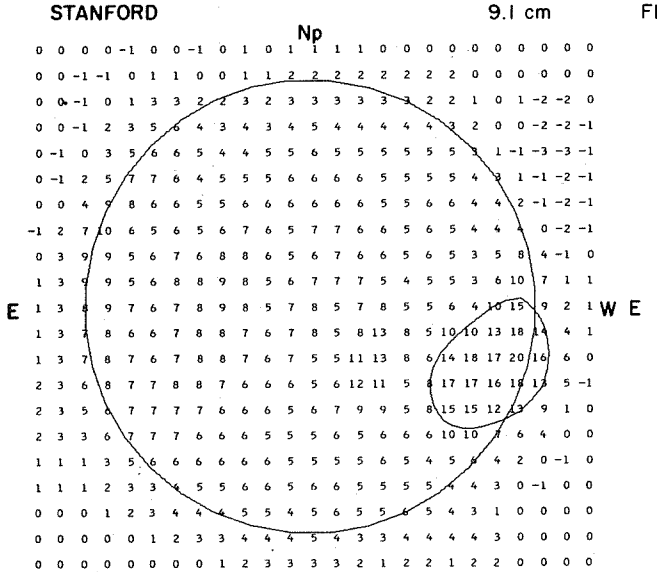


Levels
± 5
± 10
± 20
± 40
± 80

16.95-18.43 UT

STANFORD

9.1 cm

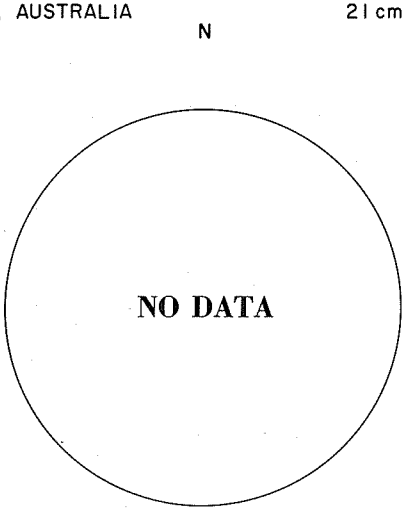


Brightness Unit 5,000° K

20-21 UT

FLEURS, AUSTRALIA

21 cm

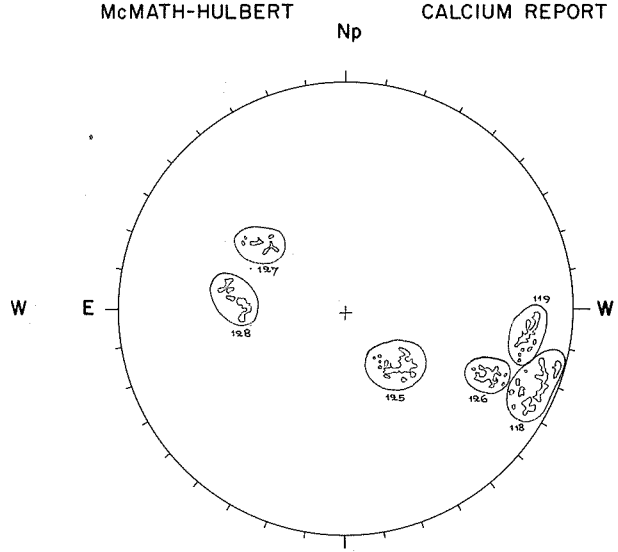


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

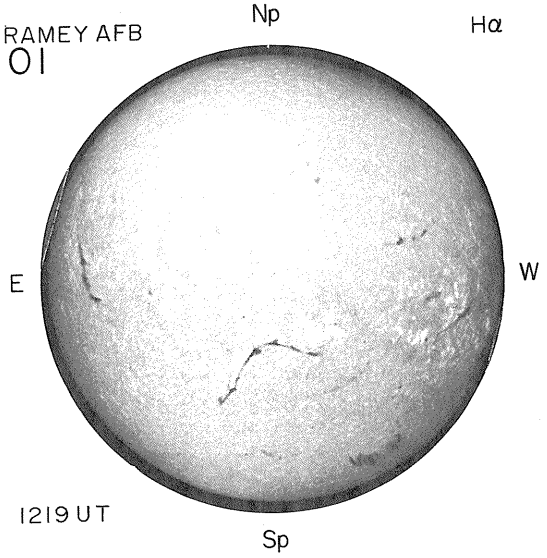
McMATH-HULBERT

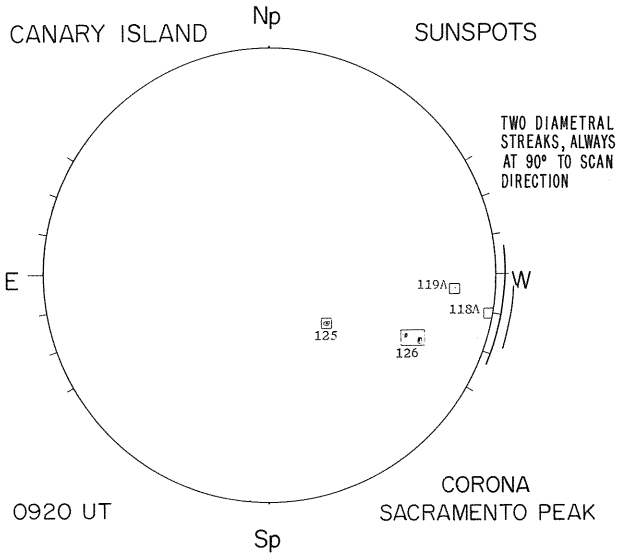
CALCIUM REPORT

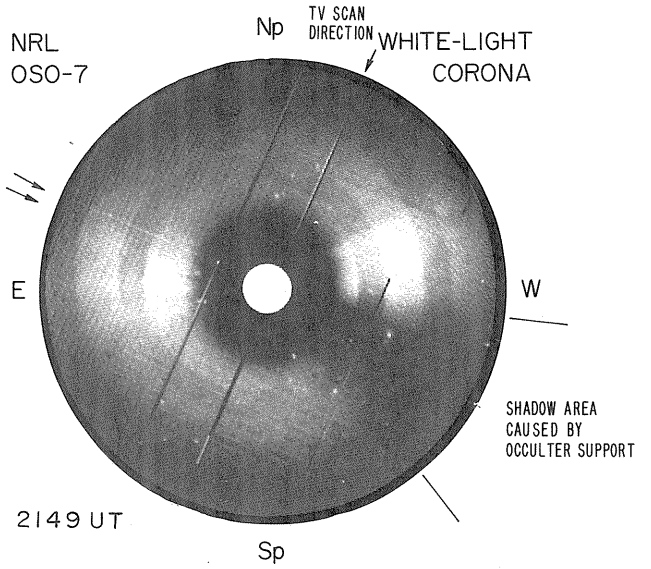


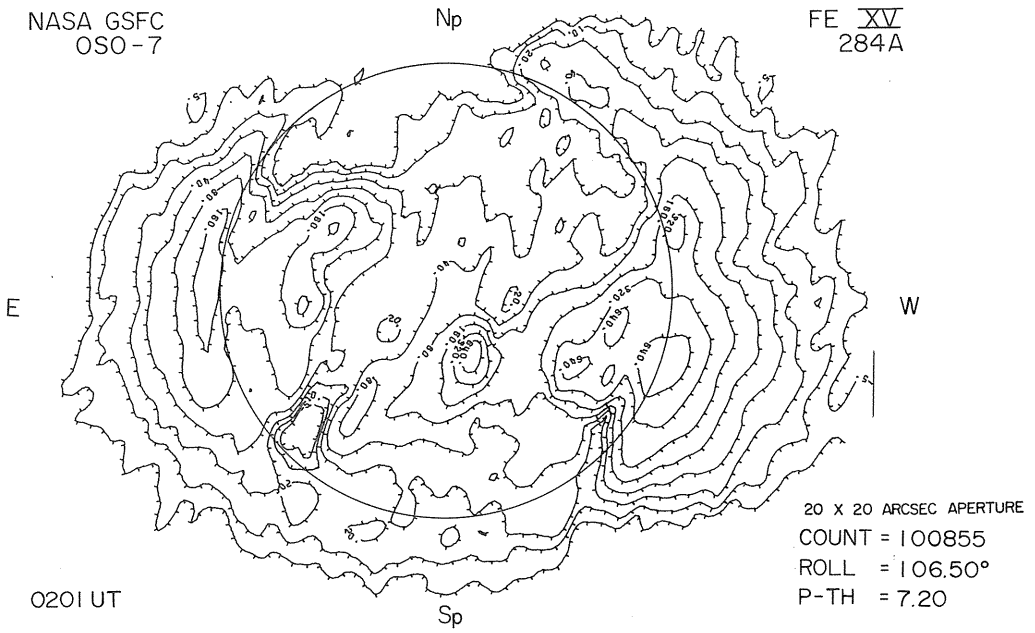
FAIR	M
18	-3400 -2.5
19	-1300 -2.5
25	-1200 -2.5
26	-1000 -3.0

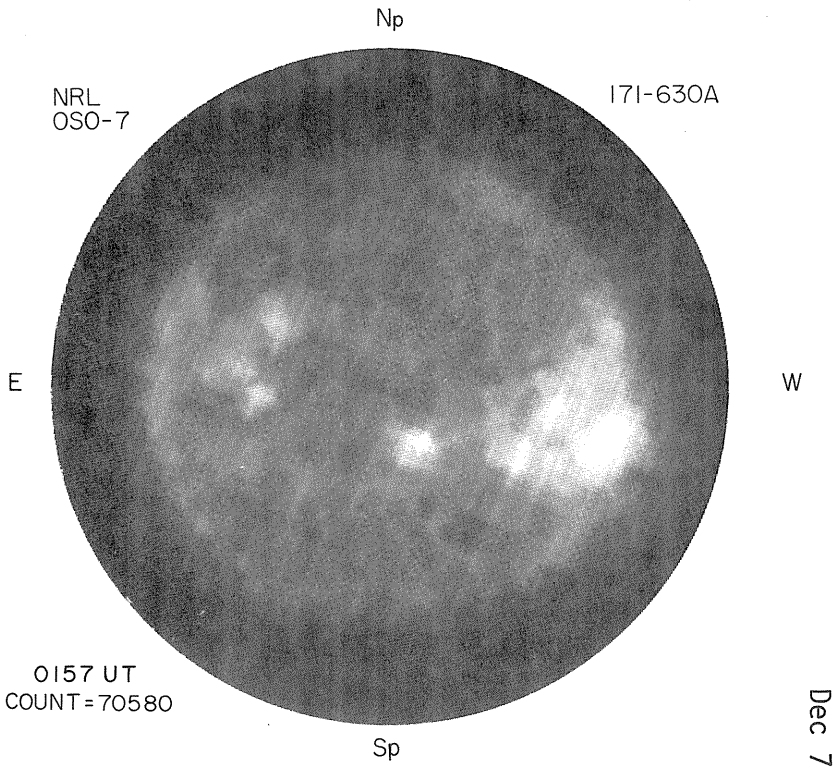
1425 UT


RAMEY AFB
OI
Np
Hα
E
W
1219 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
E
W
119A
118A
125
126
0920 UT
Sp
CORONA
SACRAMENTO PEAK


NRL
OSO-7
Np
TV SCAN
DIRECTION
WHITE-LIGHT
CORONA
TWO DIAMETRAL
STREAKS, ALWAYS
AT 90° TO SCAN
DIRECTION
E
W
SHADOW AREA
CAUSED BY
OCCULTER SUPPORT
2149 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
20 X 20 ARCSEC APERTURE
COUNT = 100855
ROLL = 106.50°
P-TH = 7.20
0201 UT
Sp


Np
NRL
OSO-7
171-630A
E
W
0157 UT
COUNT = 70580
Sp

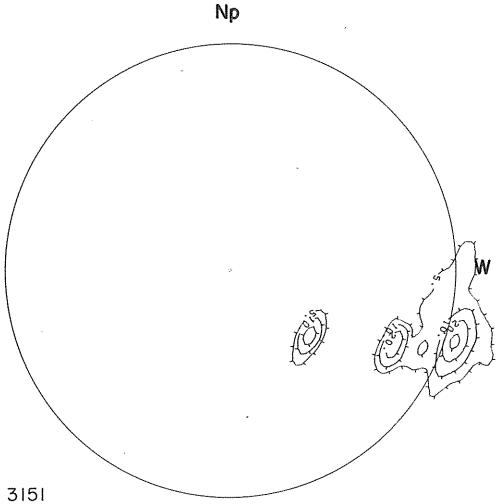
23
Dec 72

DECEMBER 2, 1972 (P = 15.69 B_o = 0.69 L_o = 236.55

24 Dec 72

NASA GSFC
OSO-7

X-RAY



COUNT = 3151
ROLL = 107.0°
P-TH = 7.21

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

0427 UT

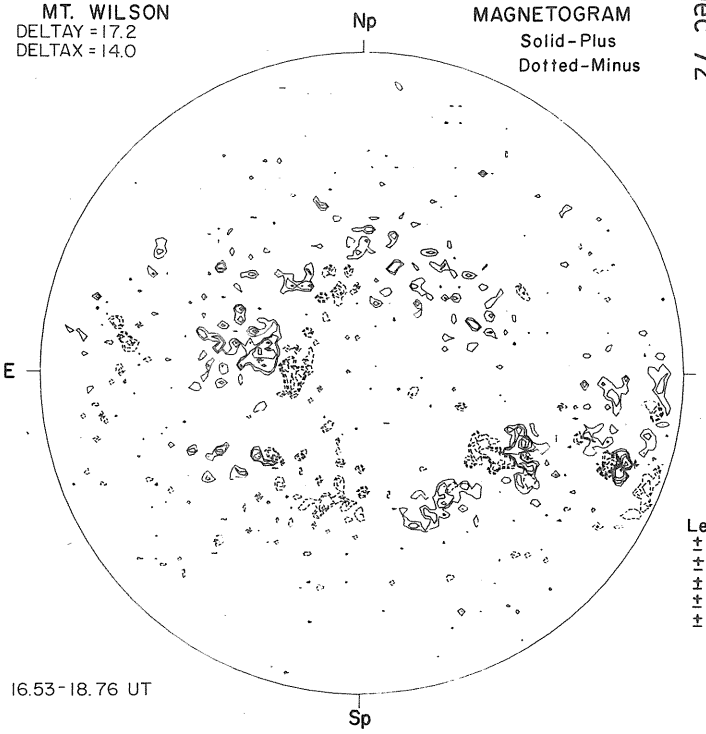
PROSPECT HILL
AFCRL

8.6 mm

Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.2
DELTAX = 14.0

MAGNETOGRAM
Solid-Plus
Dotted-Minus

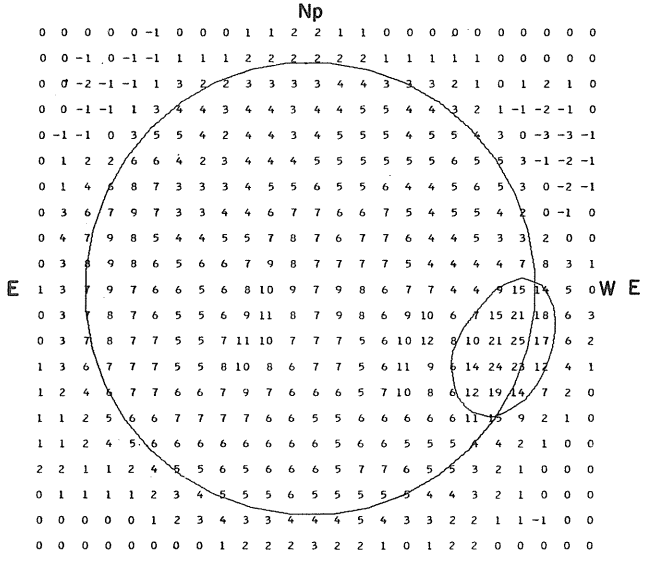


Levels
± 5
± 10
± 20
± 40
± 80

16.53-18.76 UT

STANFORD

9.1 cm

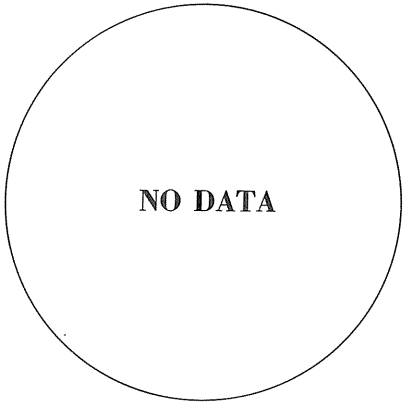


Brightness Unit 5,000° K

20-21 UT

FLEURS, AUSTRALIA

21 cm



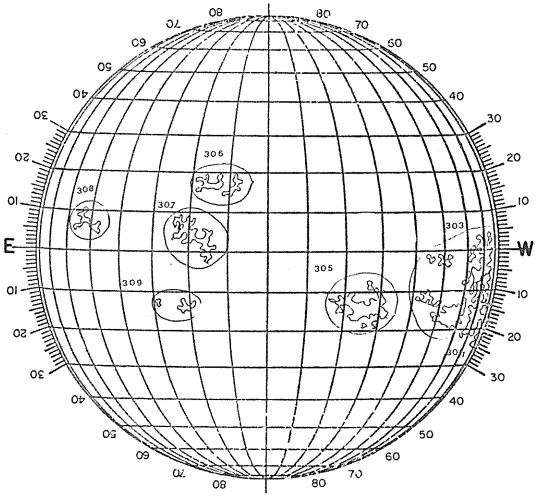
NO DATA

02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CALCIUM REPORT

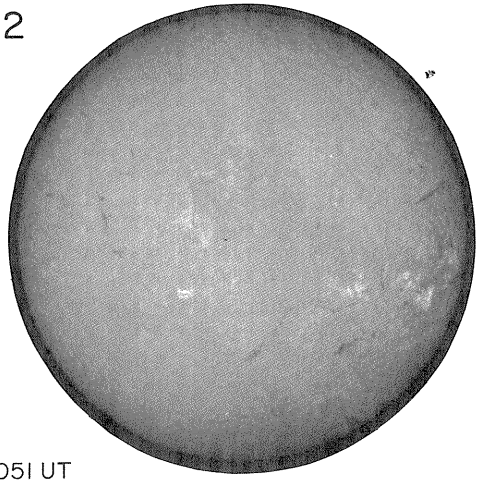
CATANIA



FAIR	GD
01 - 8210	---
03 - 4360	---
05 - 2443	---
09 - 0347	---

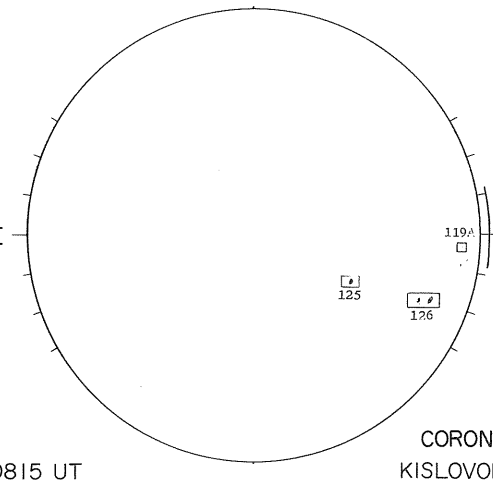
1155 UT

BOULDER
02



2051 UT

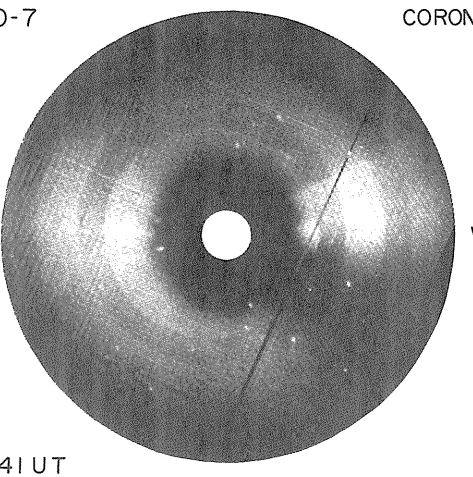
CANARY ISLAND



0815 UT

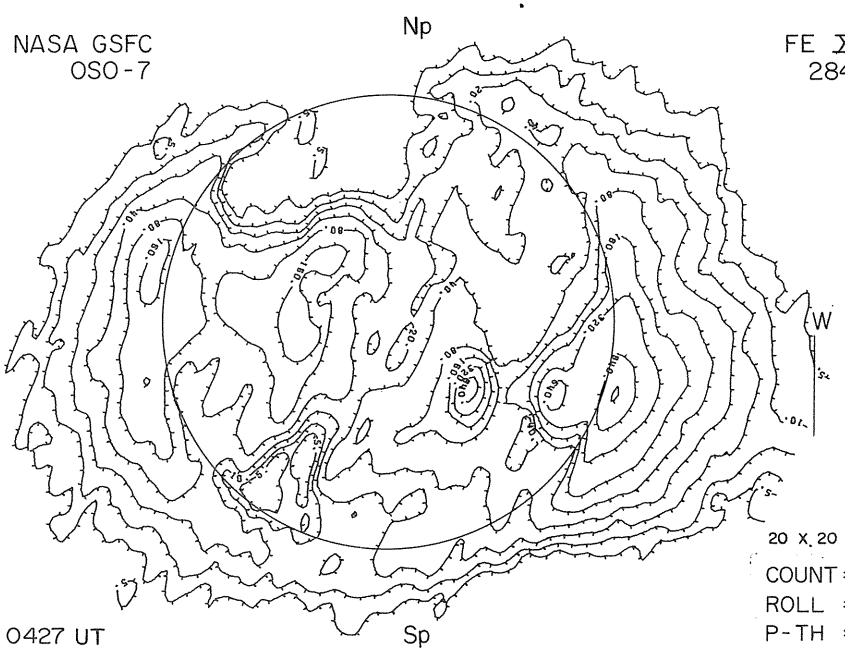
CORONA
KISLOVODSK

NRL
OSO-7



2241 UT

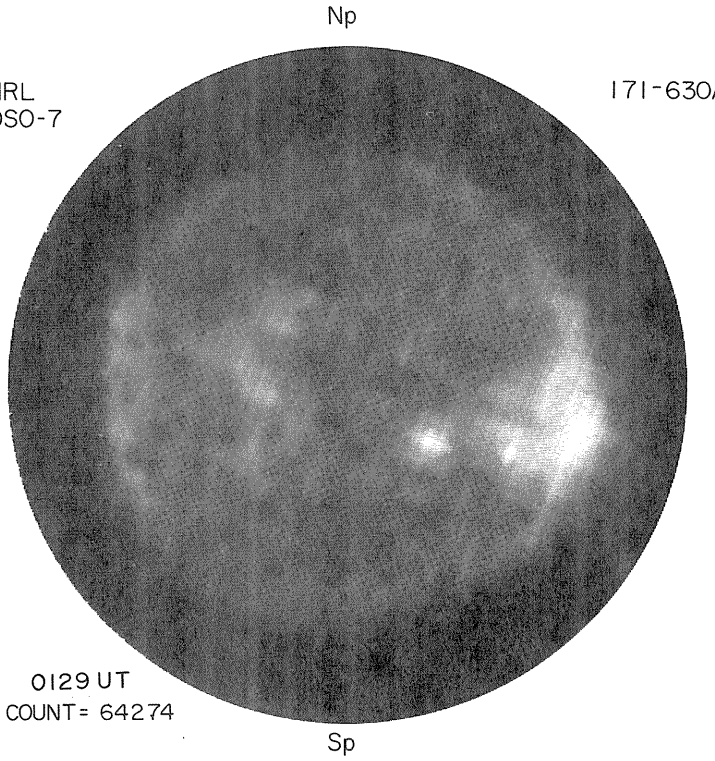
NASA GSFC
OSO-7



0427 UT

20 X 20 ARCSEC APERTURE
COUNT = 89619
ROLL = 107.0°
P-TH = 7.21

NRL
OSO-7



0129 UT
COUNT = 64274

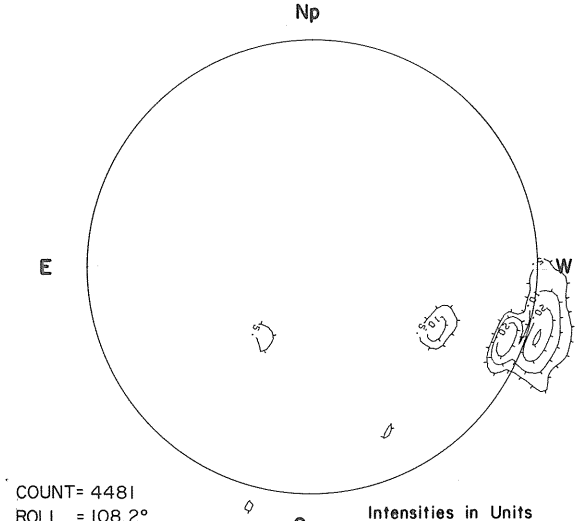
25
Dec 72

DECEMBER 3, 1972 (P= 15.29 B_o= 0.56 L_o= 223.37

26 Dec 72

NASA GSFC
OSO-7

X-RAY



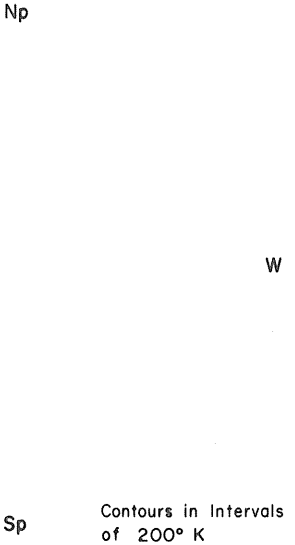
COUNT= 4481
ROLL = 108.2°
P-TH = 7.22

0456 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

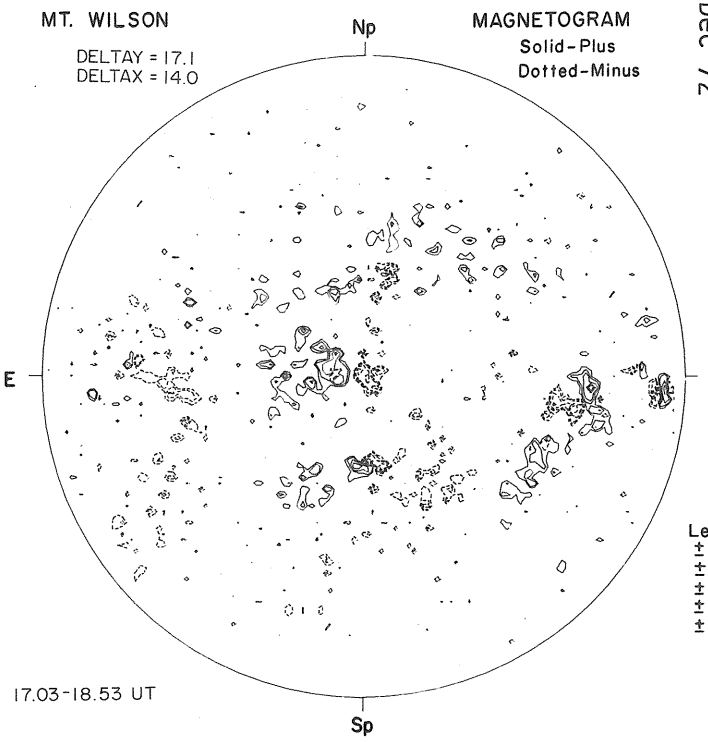


Contours in Intervals of 200° K

MT. WILSON

DELTAY = 17.1
DELTAX = 14.0

MAGNETOGRAM
Solid-Plus
Dotted-Minus

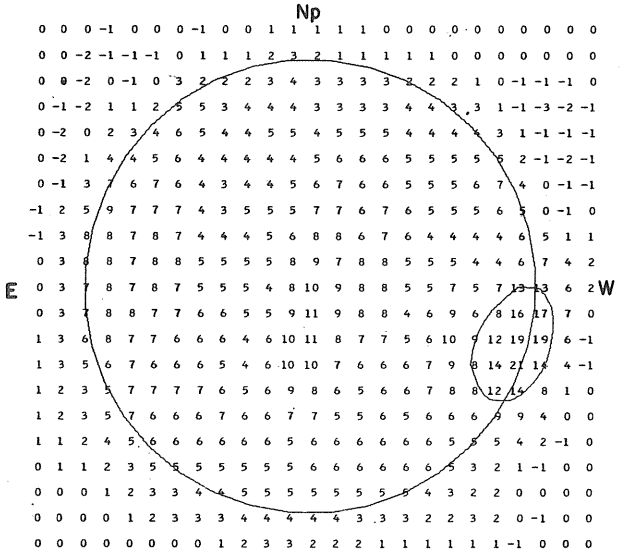


Levels
± 5
± 10
± 20
± 40
± 80

17.03-18.53 UT

STANFORD

9.1 cm

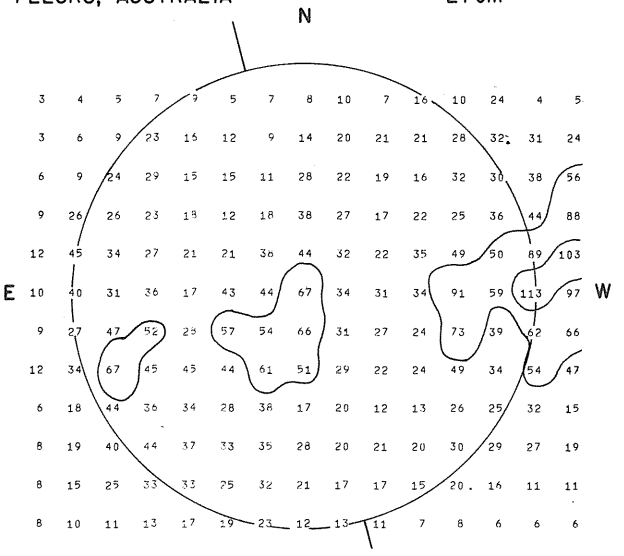


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

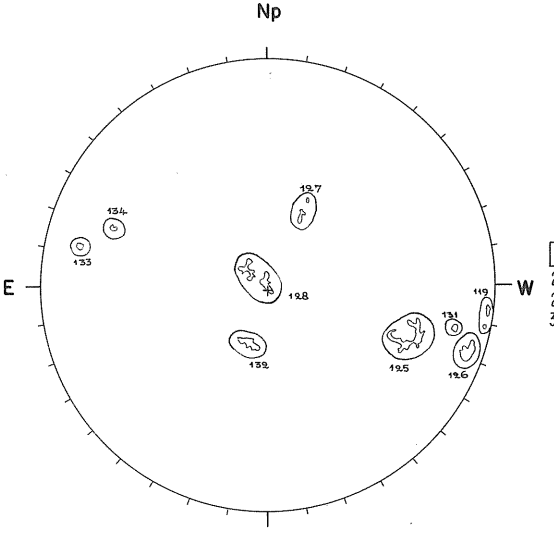


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

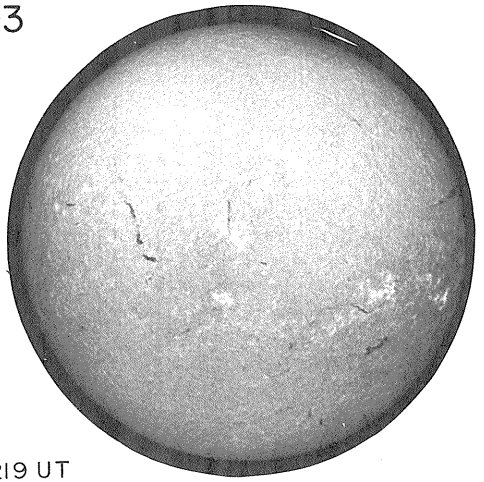
CALCIUM REPORT



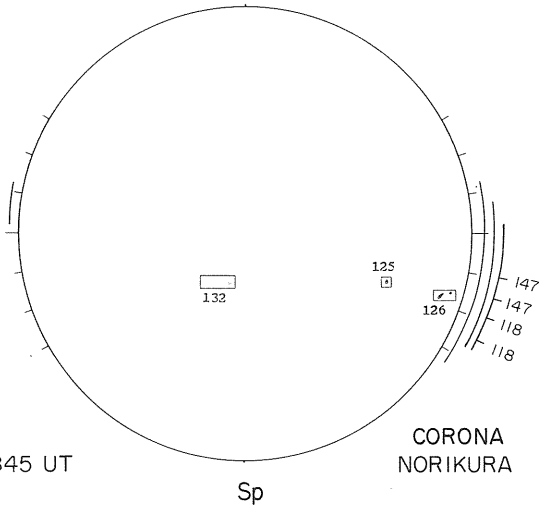
POOR	M
25 - 1100	-2.5
26 - 1500	-2.5
32 - 0500	-2.5

1515 UT

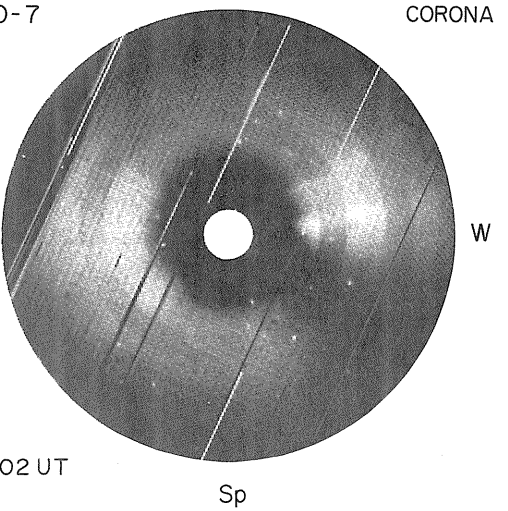
RAMEY AFB
03



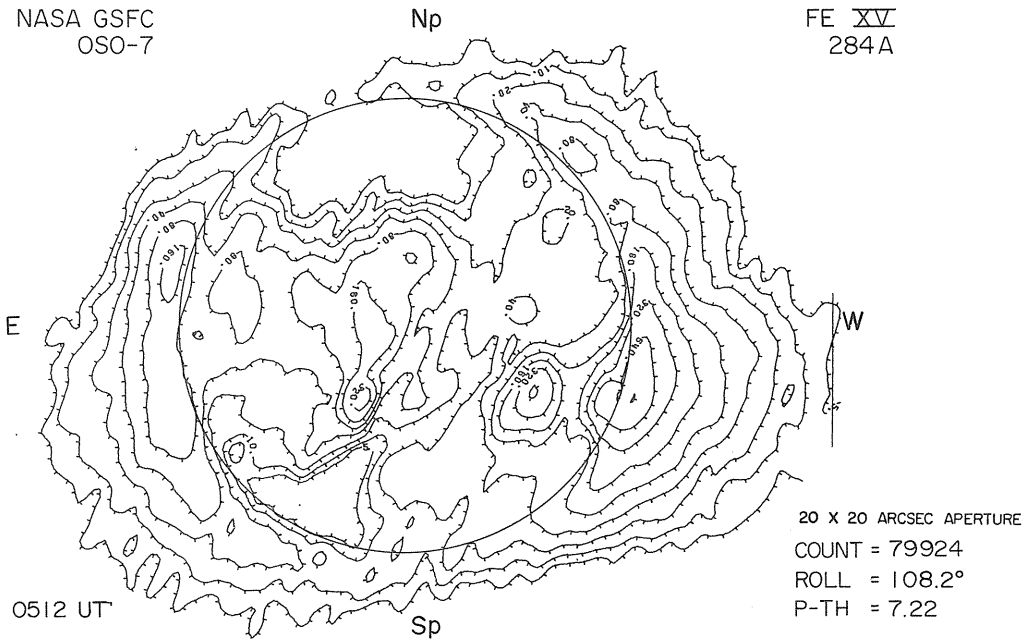
CANARY ISLAND



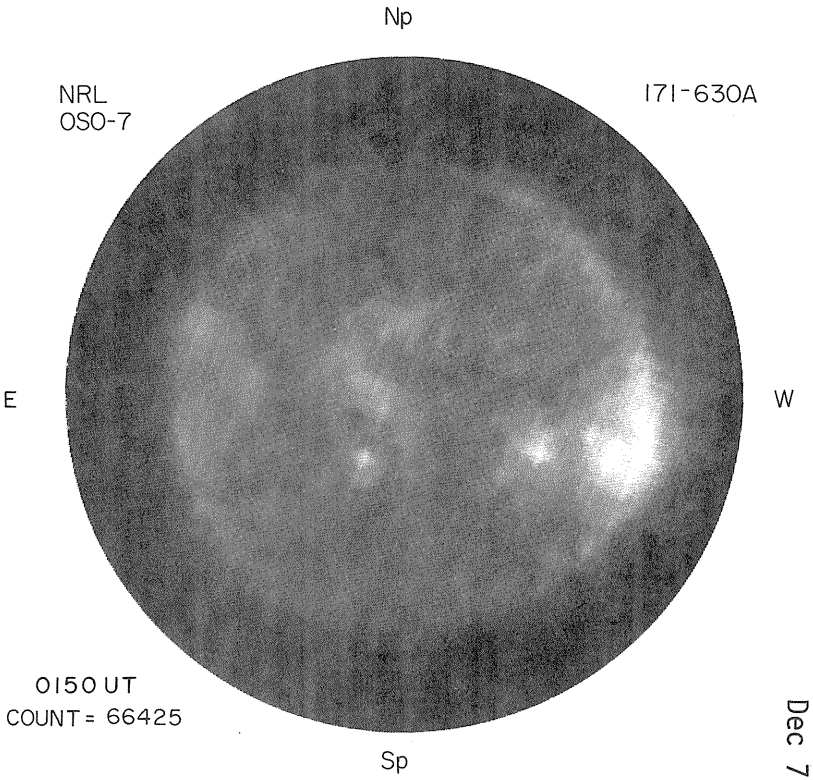
NRL
OSO-7



NASA GSFC
OSO-7



NRL
OSO-7



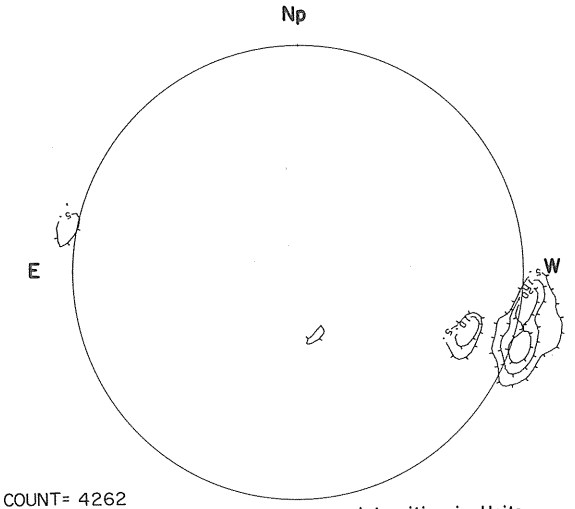
27
Dec 72

DECEMBER 4, 1972 (P= 14.89 B_o = 0.43 L_o = 210.19

28 Dec 72

NASA GSFC
OSO-7

X-RAY



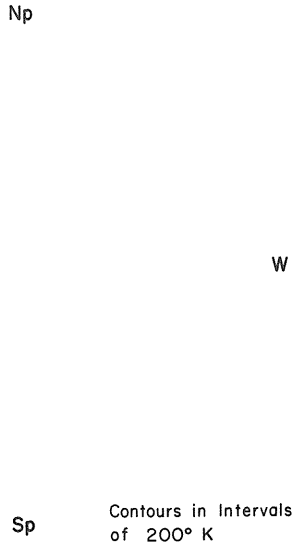
COUNT= 4262
ROLL = 109.2°
P-TH = 7.23

0533 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

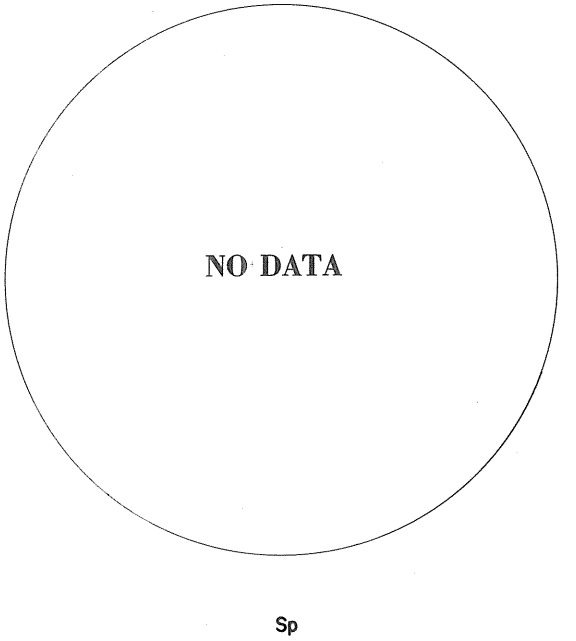
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

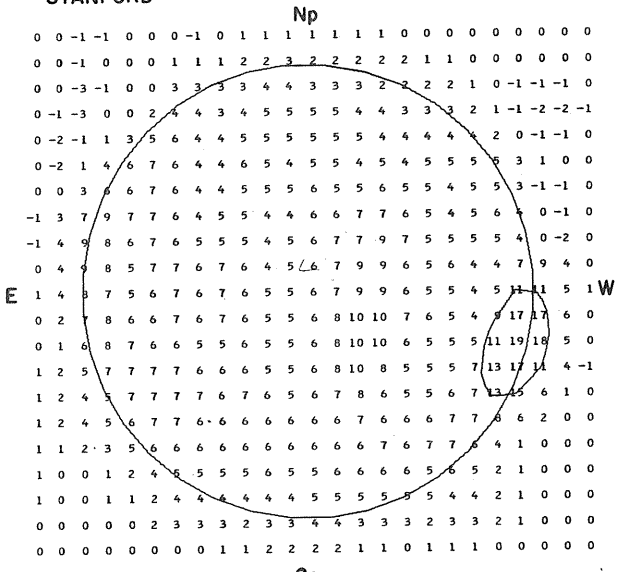
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

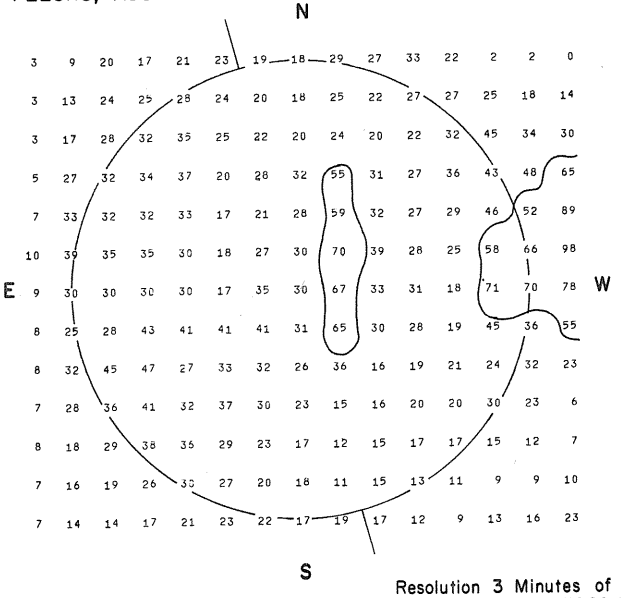


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

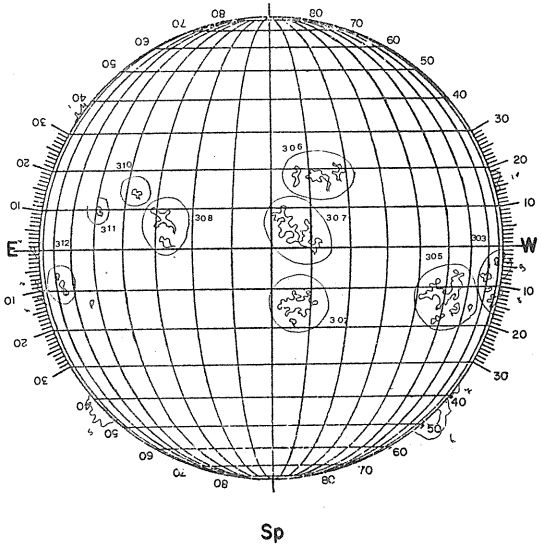


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CALCIUM REPORT

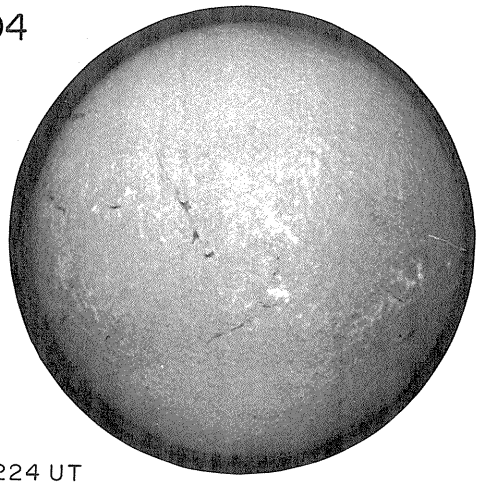
CATANIA



FAIR	GD
03 - 1662	---
05 - 2527	---
09 - 1175	---

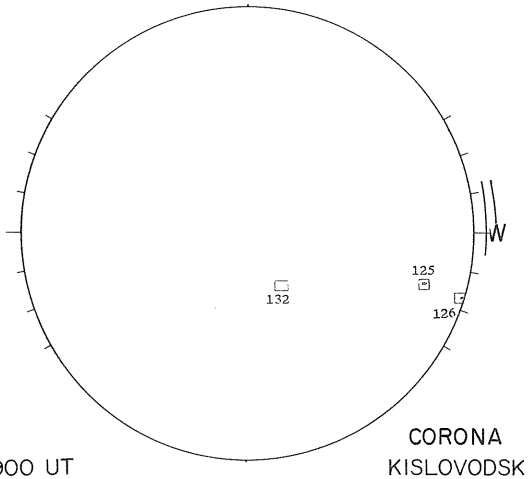
0815 UT

RAMEY AFB
04



1224 UT

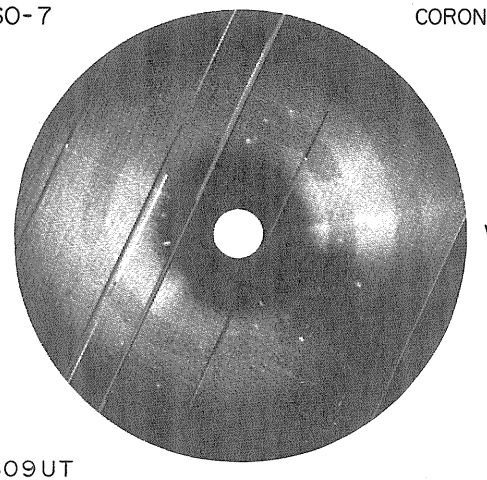
CANARY ISLAND



0900 UT

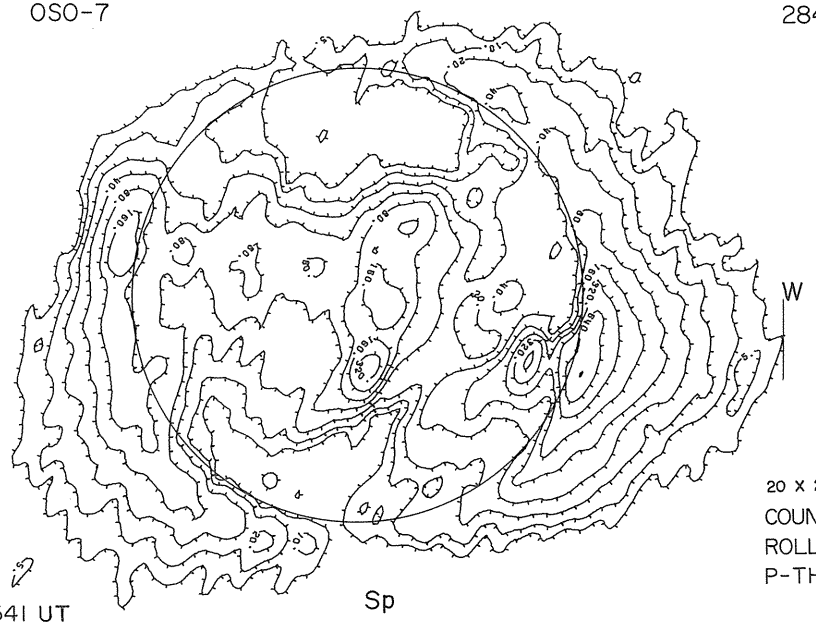
CORONA
KISLOVODSK

NRL
OSO-7



1309 UT

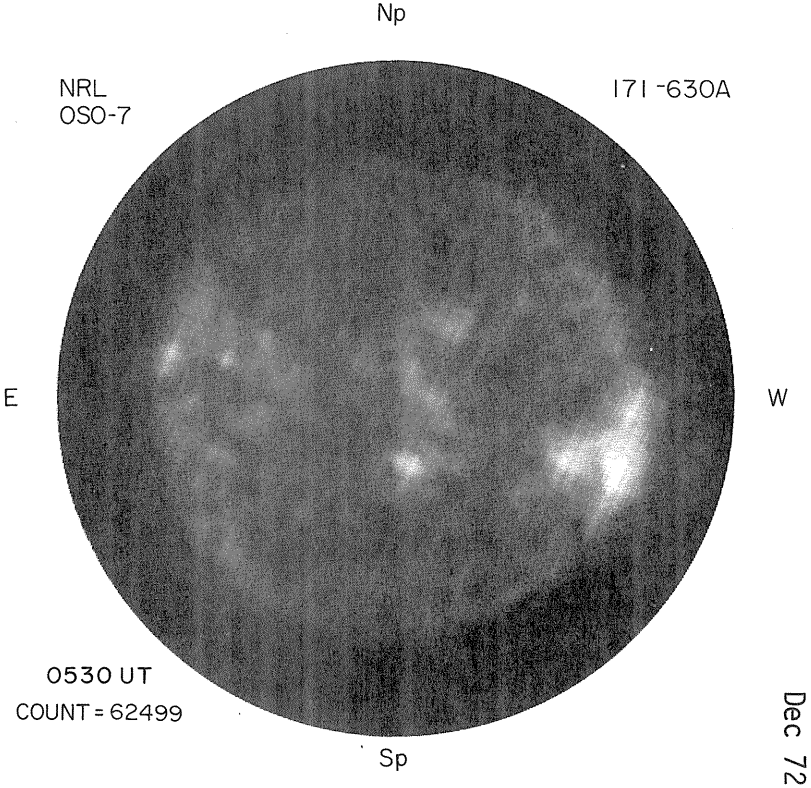
NASA GSFC
OSO-7



0541 UT

20 X 20 ARCSEC APERTURE
COUNT = 64359
ROLL = 109.2°
P-TH = 7.23

NRL
OSO-7



0530 UT
COUNT = 62499

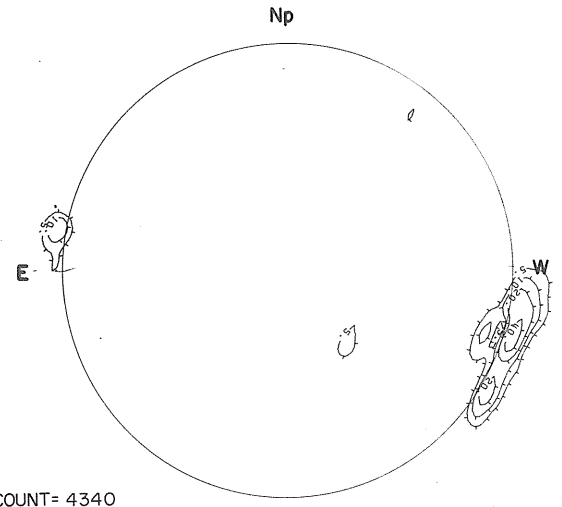
29
Dec 72

DECEMBER 5, 1972 (P= 14.49 B_o= 0.31 L_o= 197.01

30 Dec 72

NASA GSFC
OSO-7

X-RAY



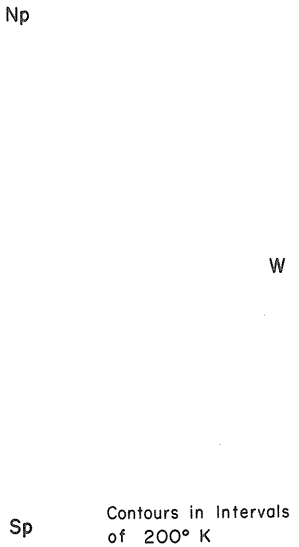
COUNT= 4340
ROLL = 109.0°
P-TH = 7.24

0259 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

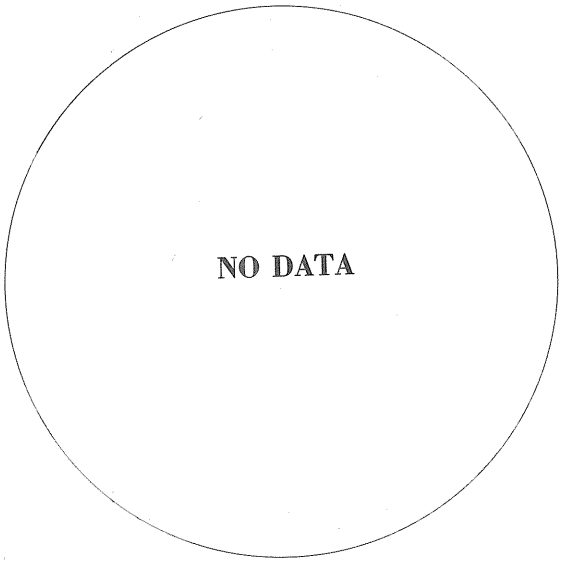
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

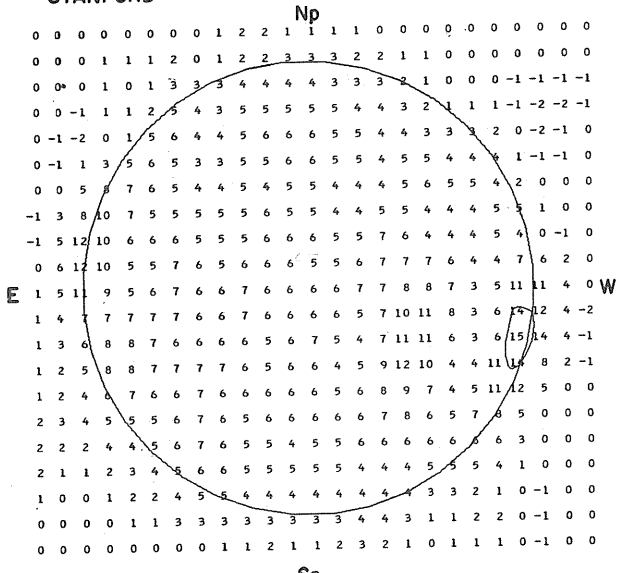
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
± 5
± 10
± 20
± 40
± 80

STANFORD

9.1 cm

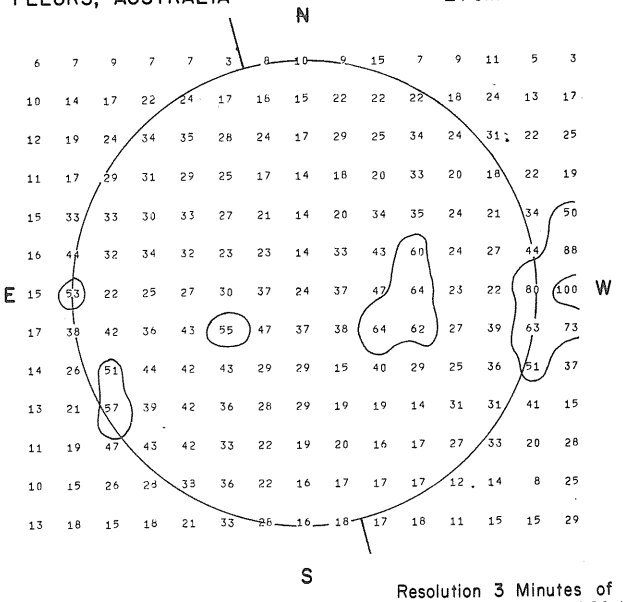


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

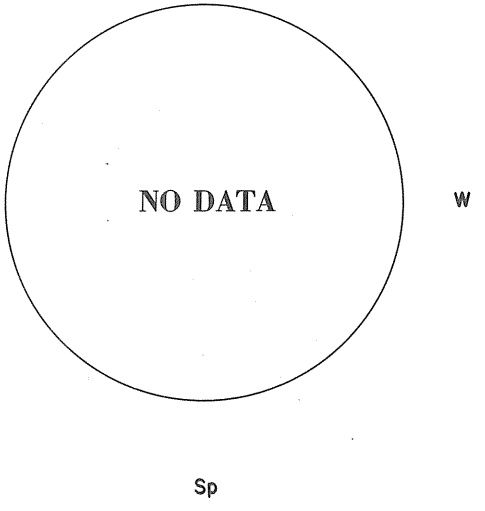


02-03 UT

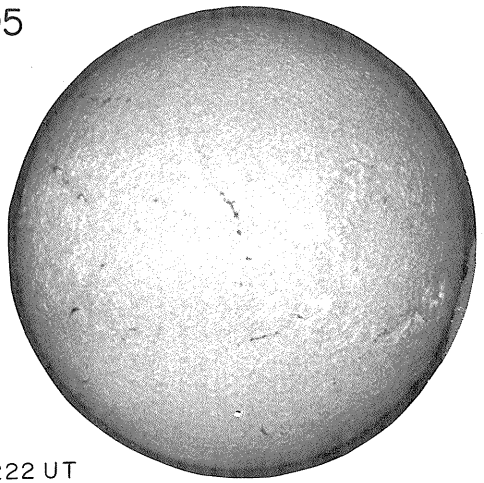
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

CALCIUM REPORT

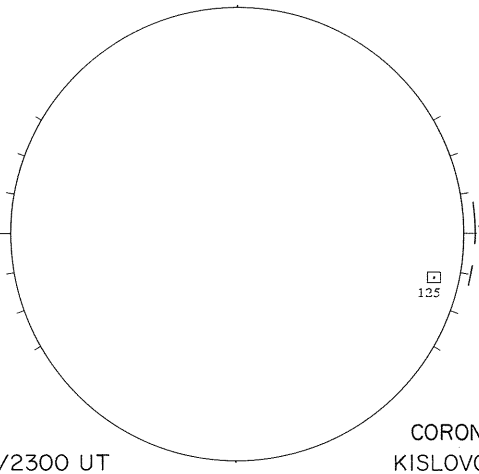


RAMEY AFB
05



1222 UT

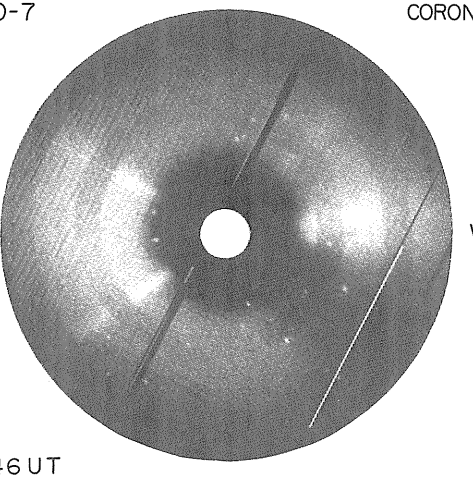
CARNARVON



04/2300 UT

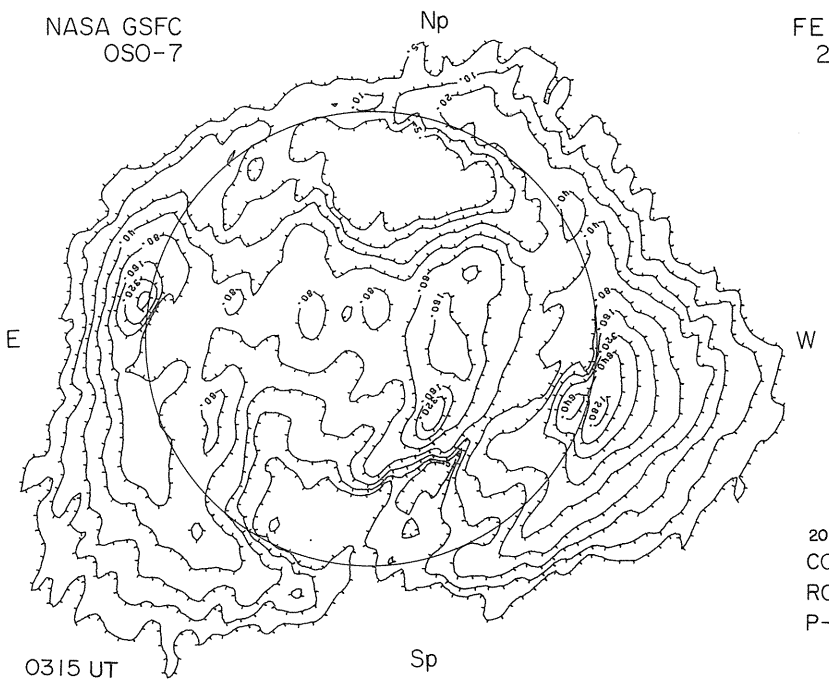
CORONA
KISLOVODSK

NRL
OSO-7



1946 UT

NASA GSFC
OSO-7

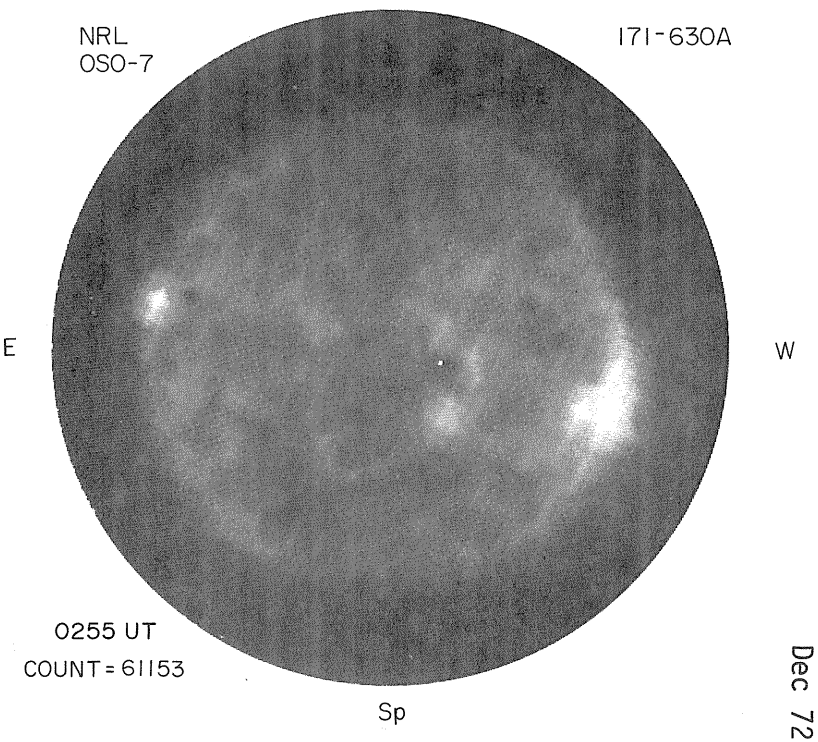


0315 UT

FE XV
284A

20 X 20 ARCSEC APERTURE
COUNT = 71685
ROLL = 109.0°
P-TH = 7.24

NRL
OSO-7



0255 UT
COUNT = 61153

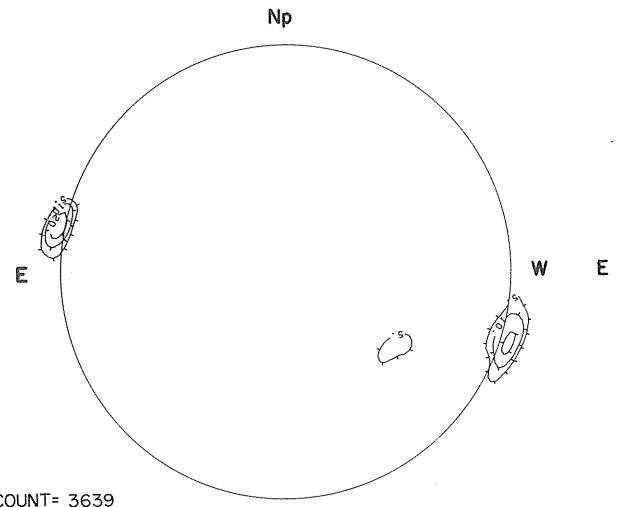
31
Dec 72

DECEMBER 6, 1972 (P= 14.08 B_o= 0.18 L_o= 183.84

32
Dec 72

NASA GSFC
OSO-7

X-RAY



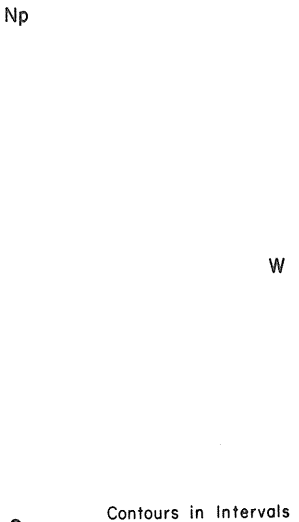
COUNT= 3639
ROLL = 109.4°
P-TH = 7.24

0346 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

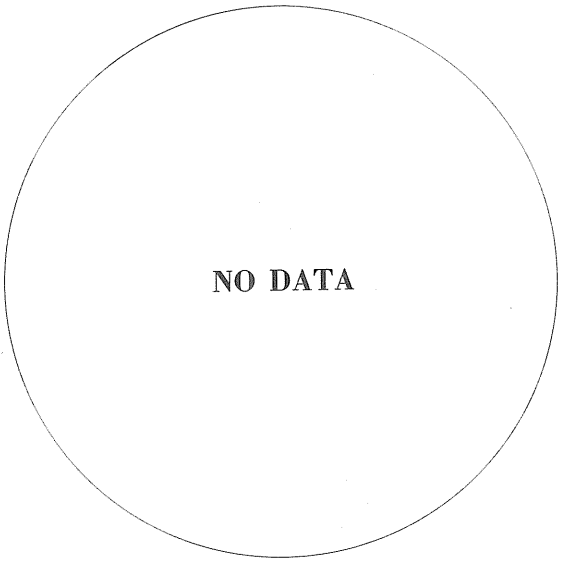
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

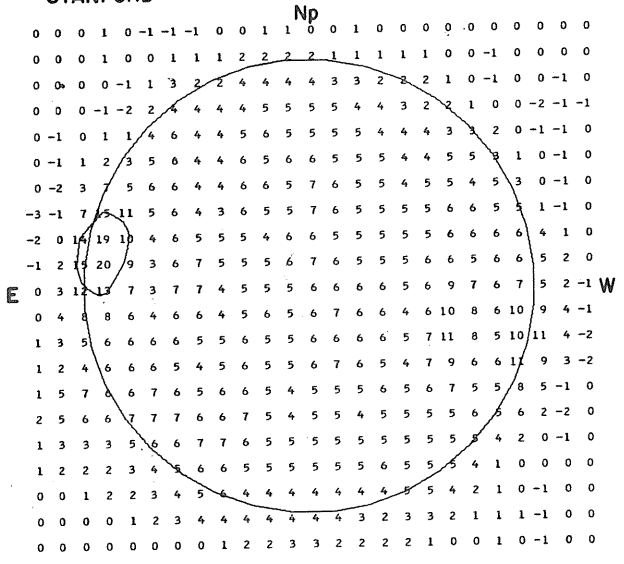
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
± 5
± 10
± 20
± 40
± 80

STANFORD

9.1 cm

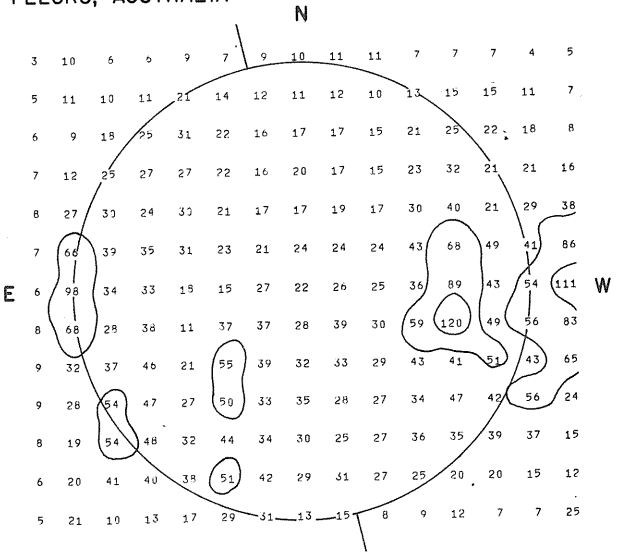


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

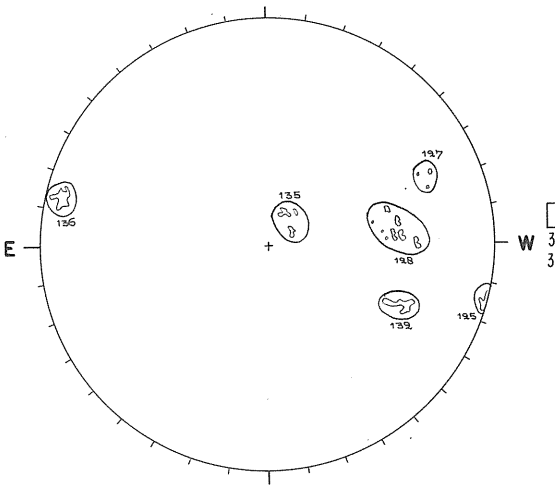


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

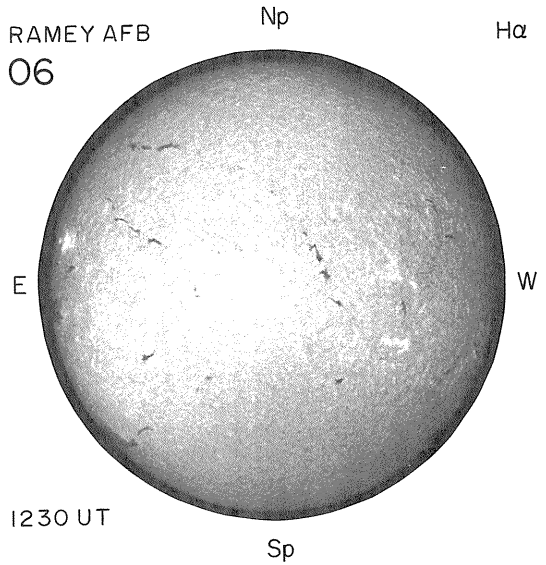
McMATH-HULBERT

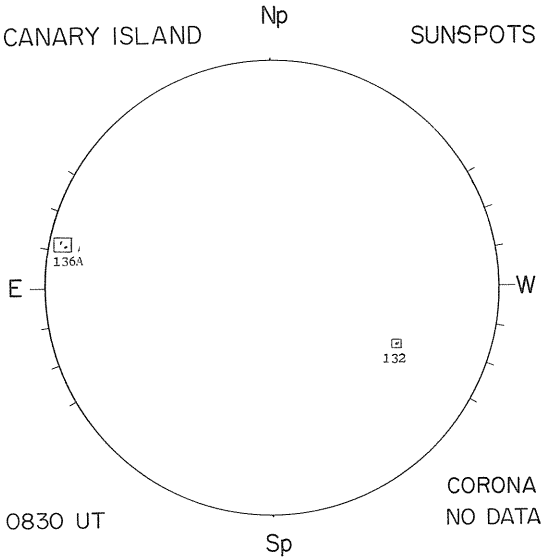
CALCIUM REPORT

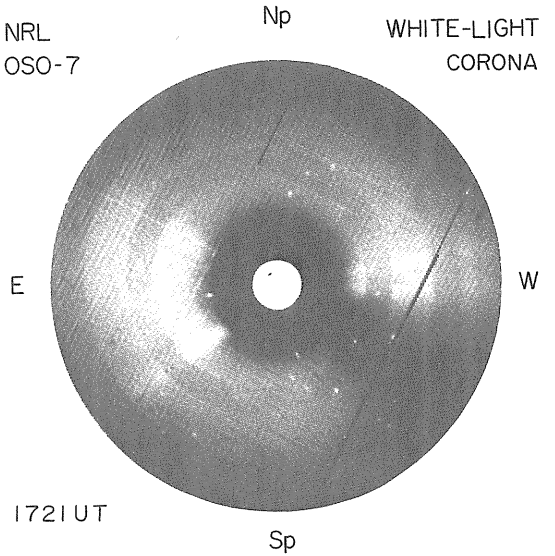


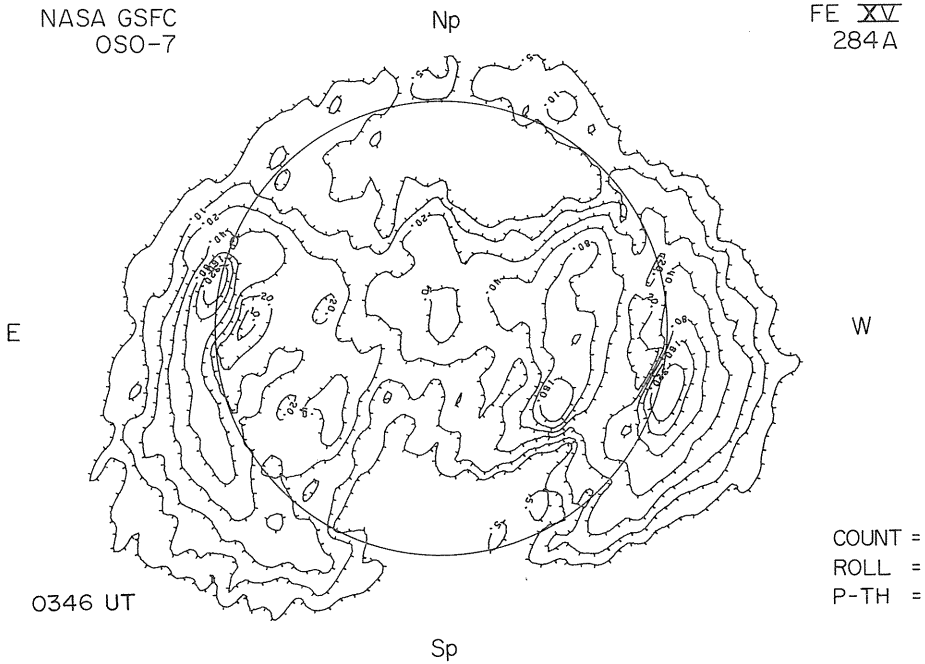
FAIR	M
32 - 0700	-3.0
36 - 1800	-3.5

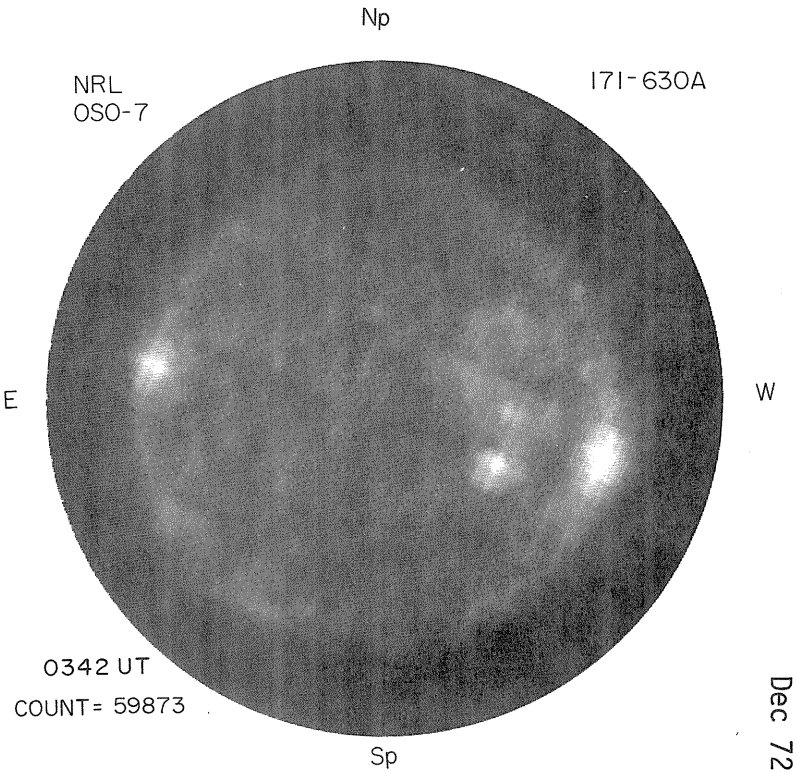
1530 UT


RAMEY AFB
06
Np
Hα
E
W
1230 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
136A
E
W
132
0830 UT
Sp
CORONA
NO DATA


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
1721 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
0346 UT
Sp
COUNT = 34309
ROLL = 109.4°
P-TH = 7.24


Np
NRL
OSO-7
171-630A
E
W
0342 UT
COUNT = 59873
Sp

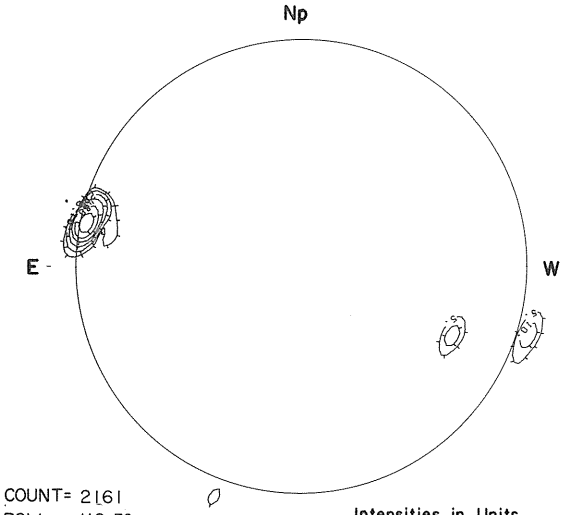
DECEMBER 7, 1972 (P= 13.66 B_o= 0.05 L_o= 170.66

MT. WILSON

34
Dec 72

NASA GSFC
OSO-7

X-RAY



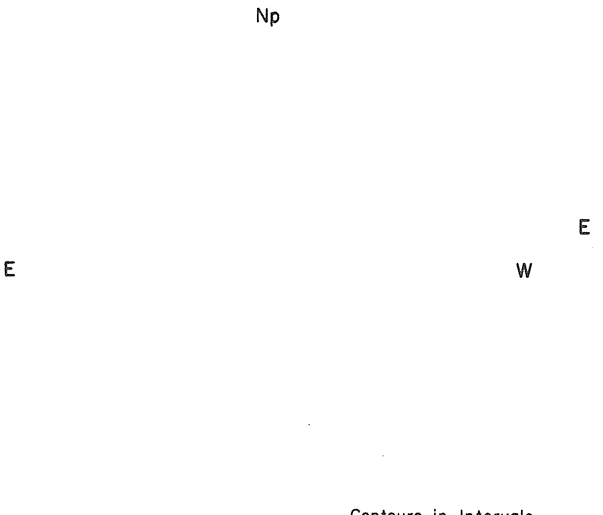
COUNT= 2161
ROLL = 110.5°
P-TH = 7.24

0134 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

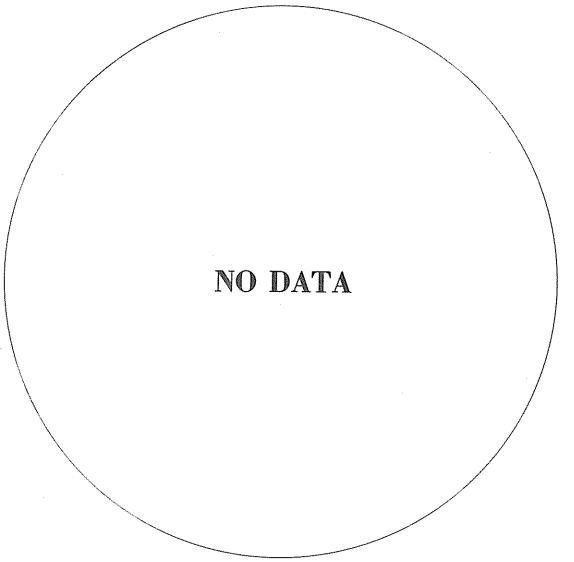
PROSPECT HILL
AFCRL

8.6 mm



Contours in Intervals of 200° K

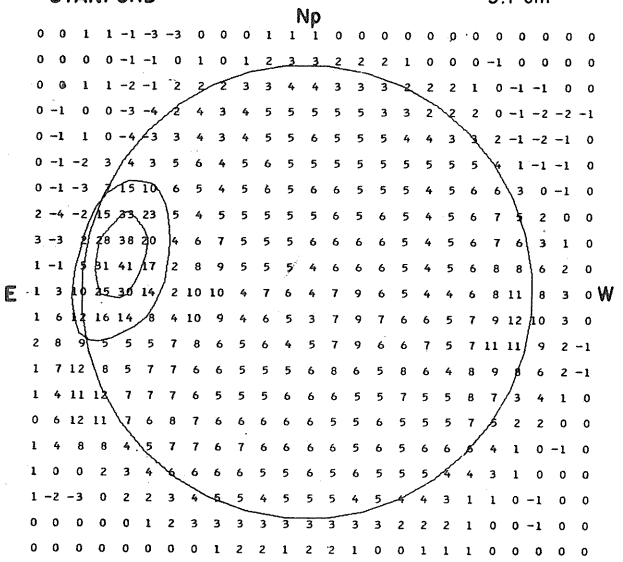
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

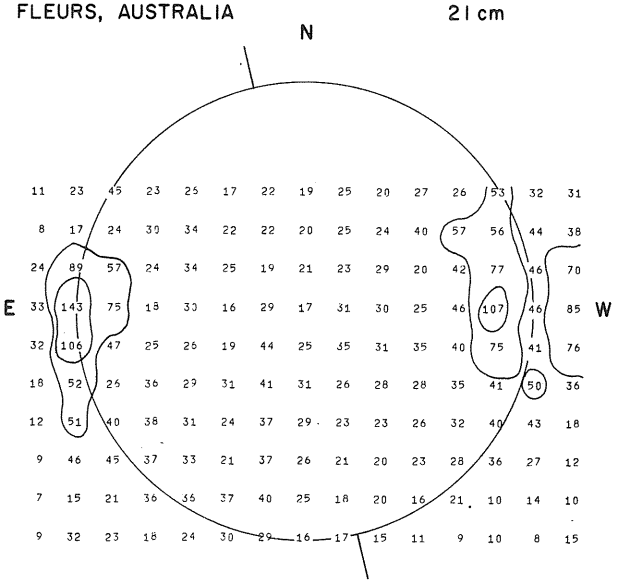


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

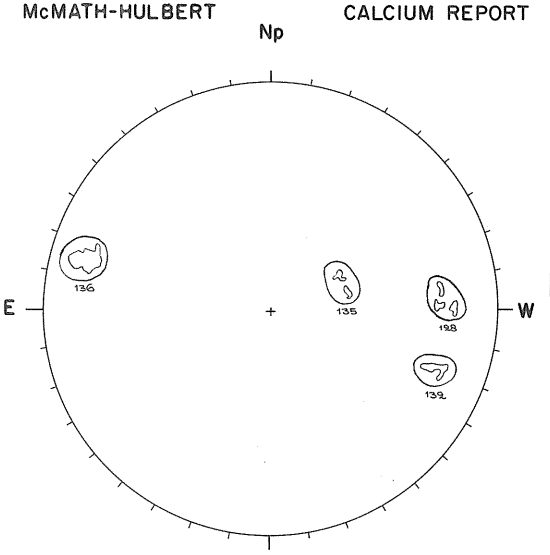


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

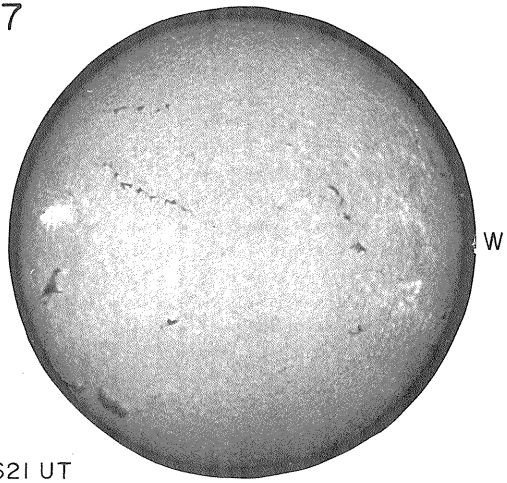
CALCIUM REPORT



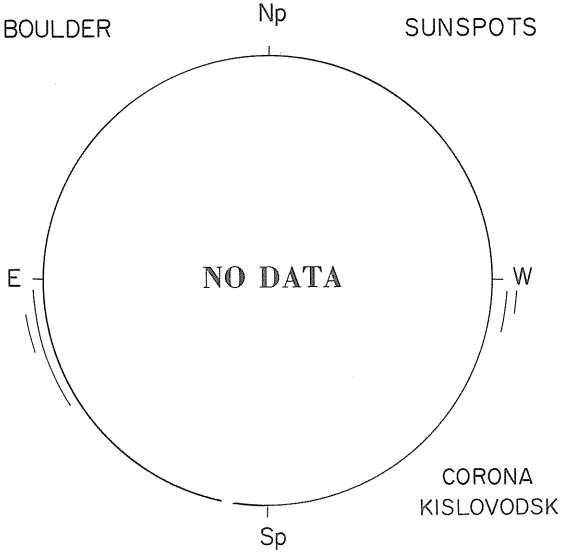
POOR	B
32 - 0900	-2.5
36 - 3100	-3.5

1450 UT

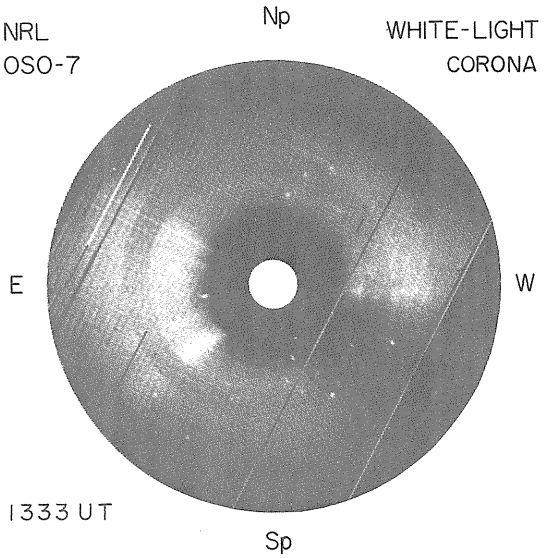
RAMEY AFB
07



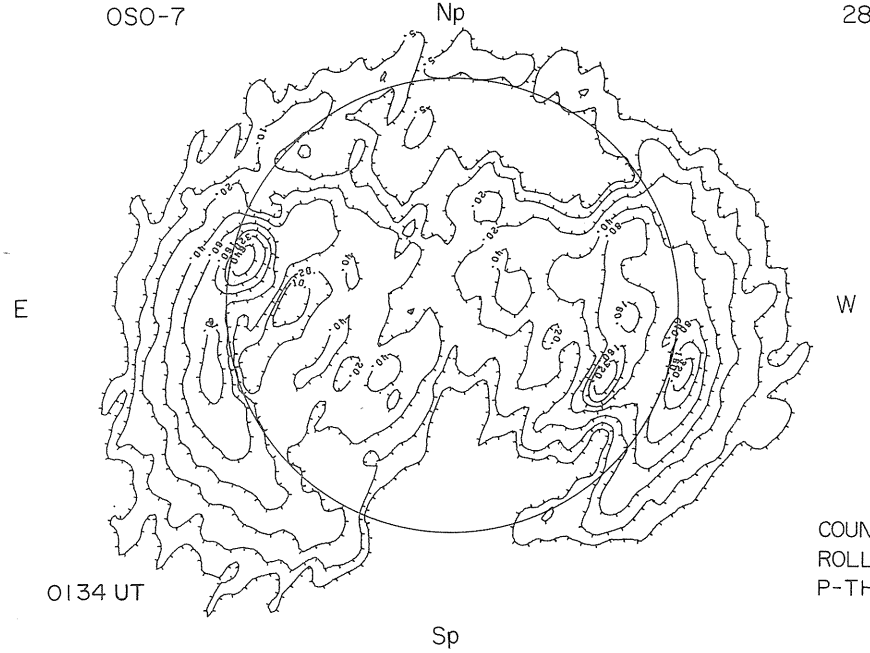
BOULDER



NRL
OSO-7



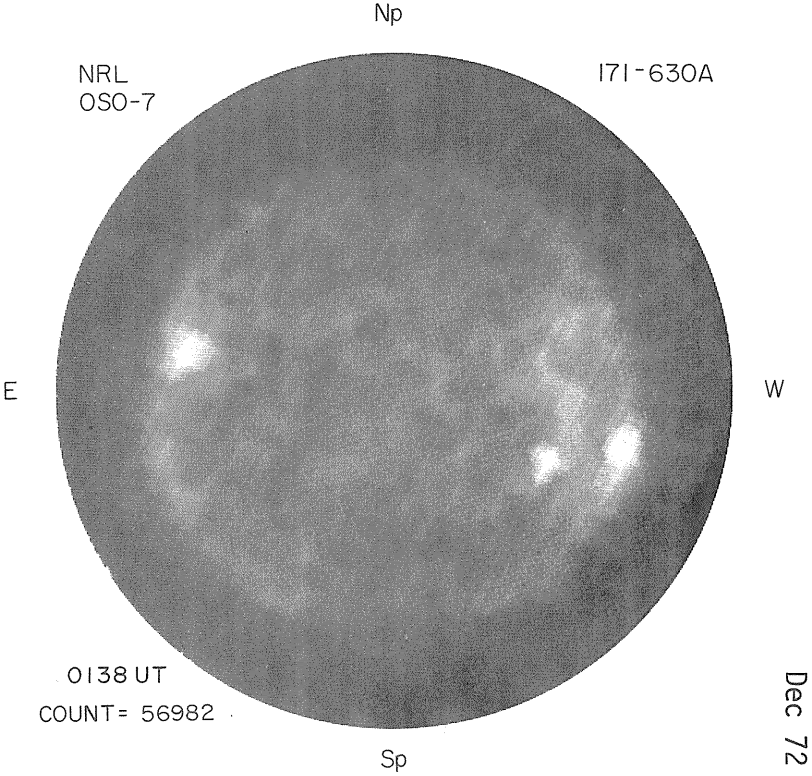
NASA GSFC
OSO-7



FE XV
284 A

COUNT = 37442
ROLL = 110.5°
P-TH = 7.24

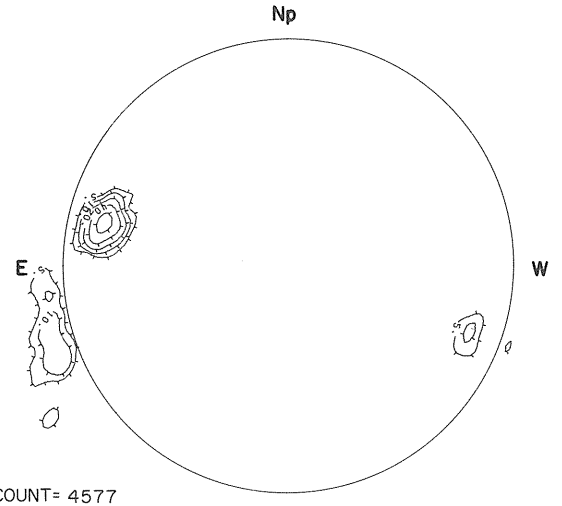
NRL
OSO-7



DECEMBER 8, 1972 (P= 13.24 B_o= -0.08 L_o= 157.48

NASA GSFC
OSO-7

X-RAY



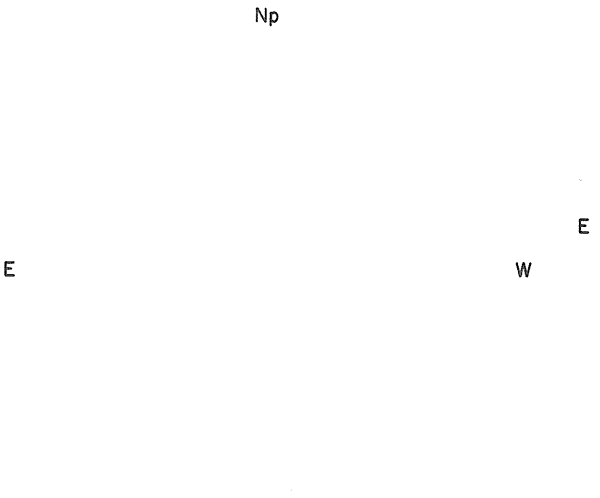
COUNT= 4577
ROLL = 109.8°
P-TH = 7.24

0146 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

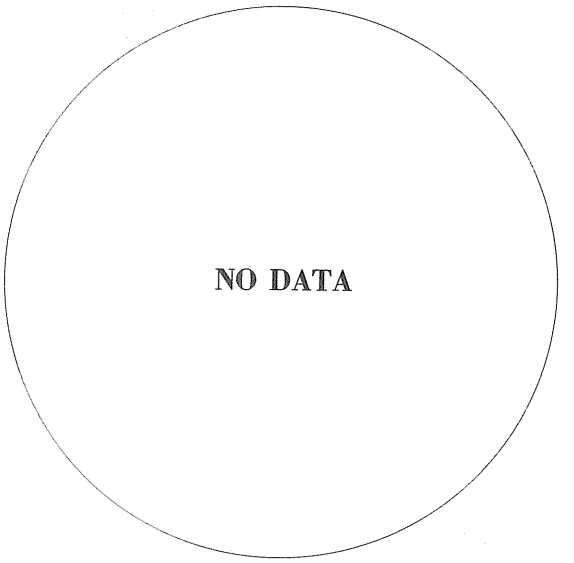
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

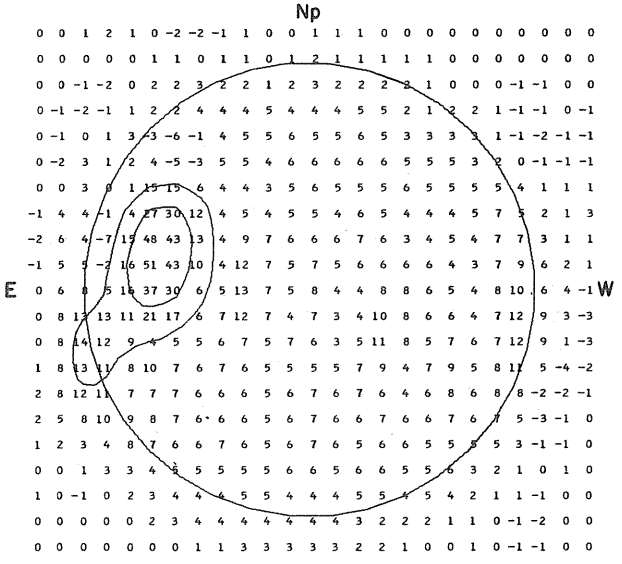
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

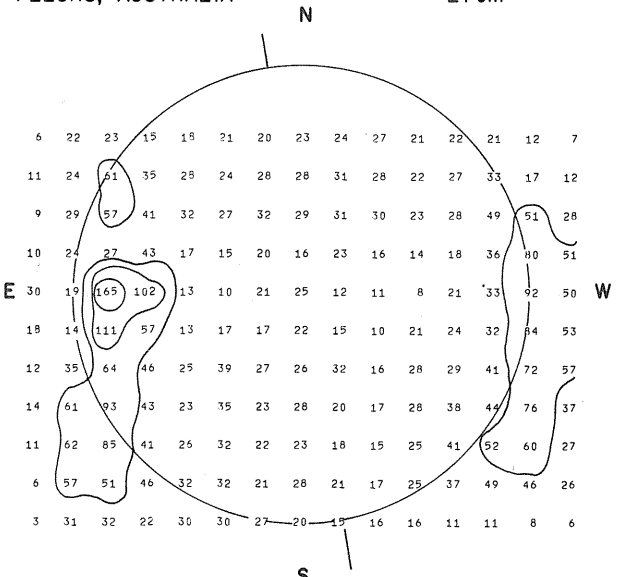


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

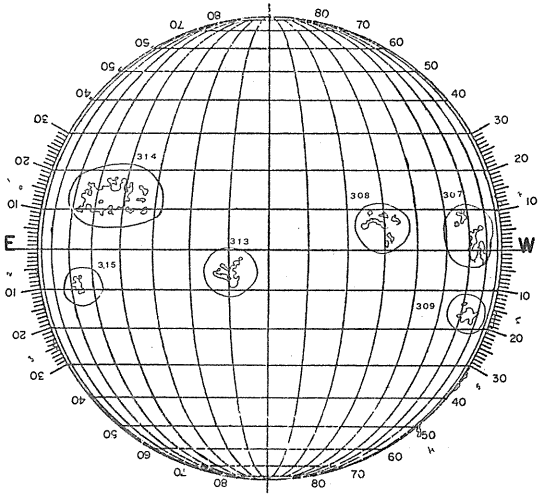


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CATANIA

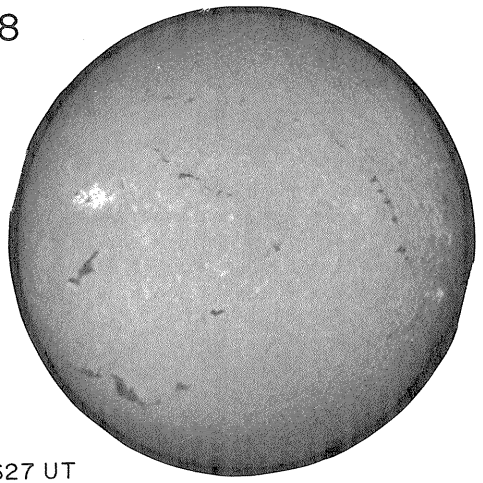
CALCIUM REPORT



GOOD	GD
09-1166	---
14-4463	---

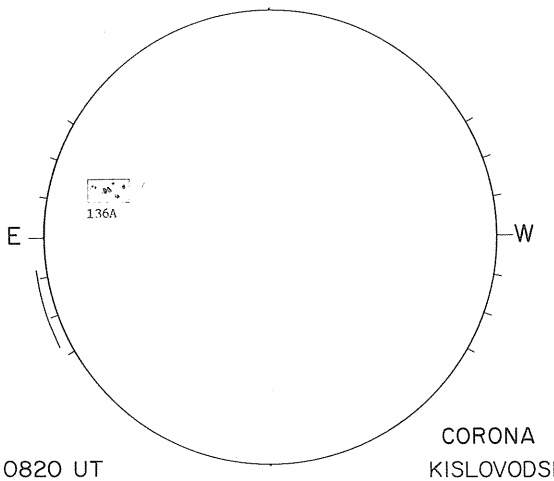
0920 UT

RAMEY AFB
08



1627 UT

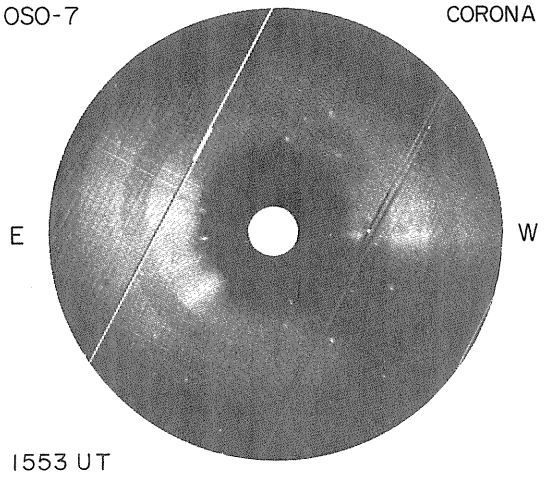
CANARY ISLAND



0820 UT

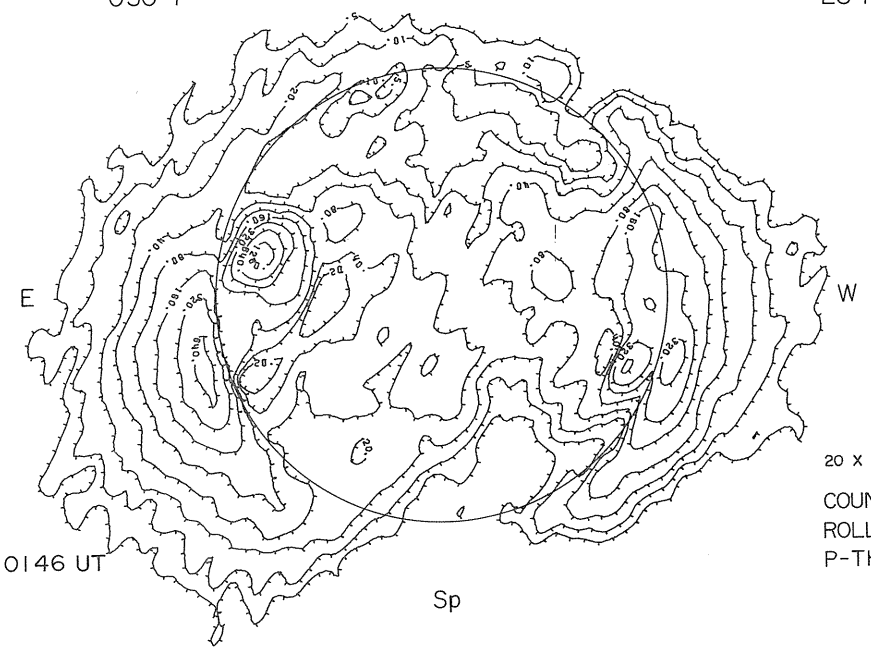
CORONA
KISLOVODSK

NRL
OSO-7



1553 UT

NASA GSFC
OSO-7



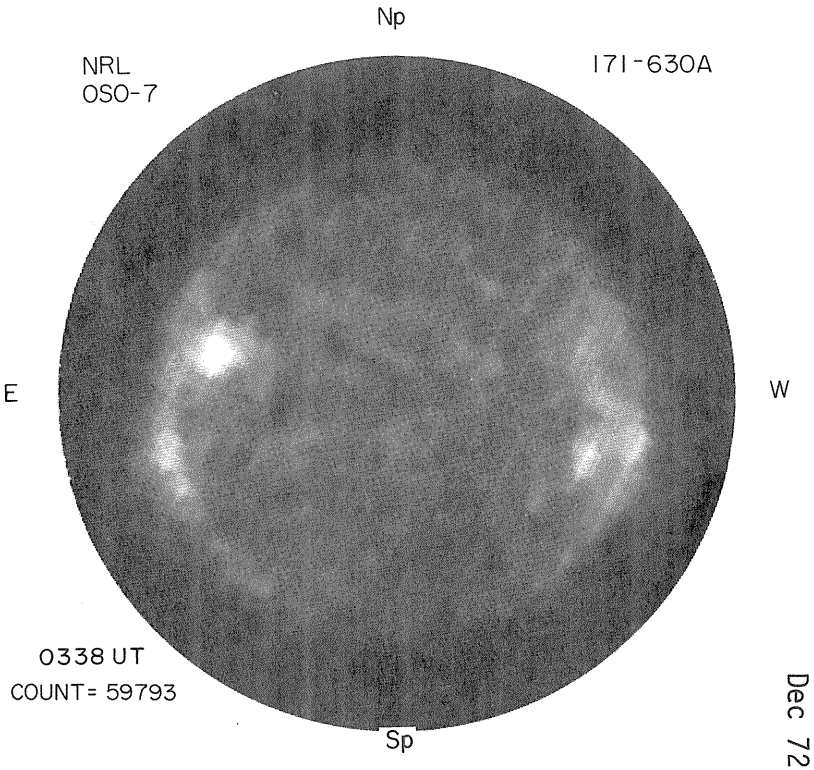
0146 UT

FE XV
284A

20 X 20 ARCSEC APERTURE

COUNT = 78625
ROLL = 109.8°
P-TH = 7.24

NRL
OSO-7

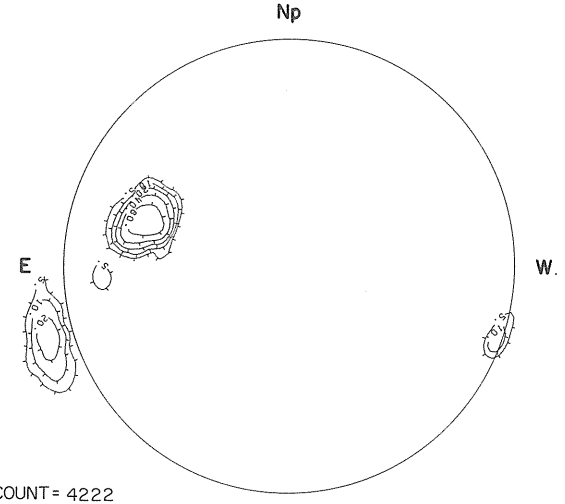


0338 UT
COUNT= 59793

DECEMBER 9, 1972 (P= 12.81 B_o= -0.21 L_o= 144.31

NASA GSFC
OSO-7

X-RAY



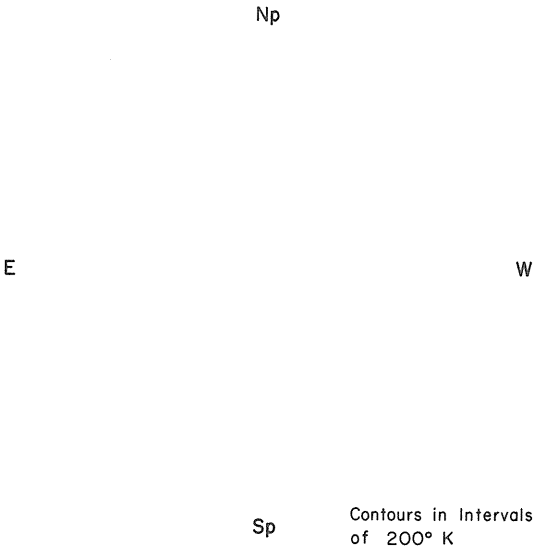
COUNT= 4222
ROLL = 109.9°
P-TH = 7.24

0405 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

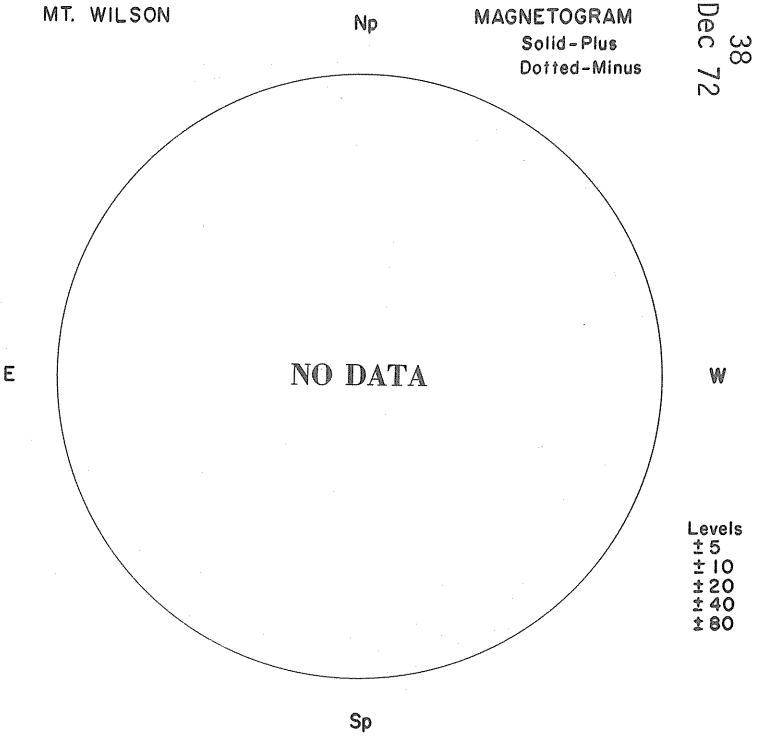
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

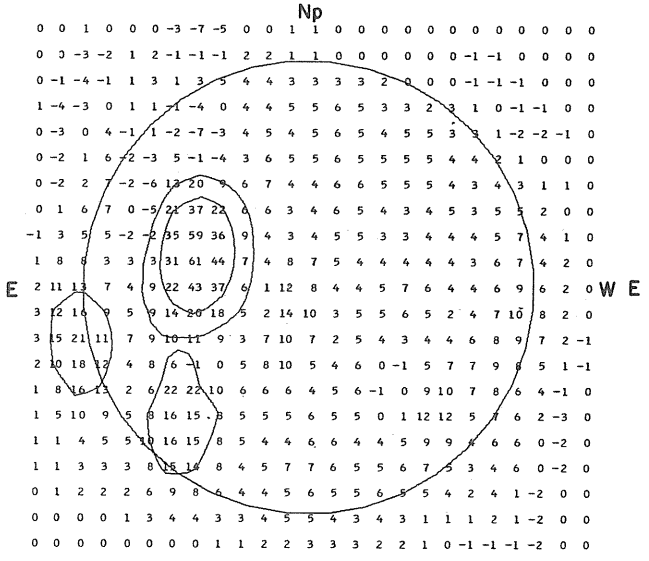
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

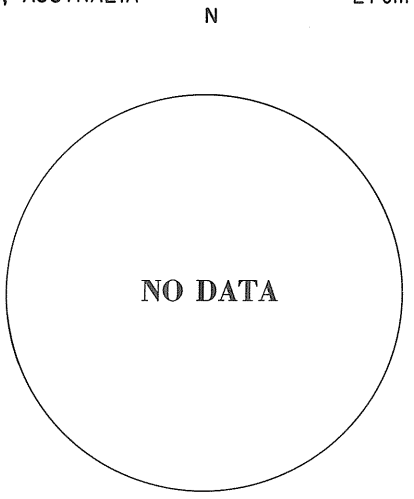


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

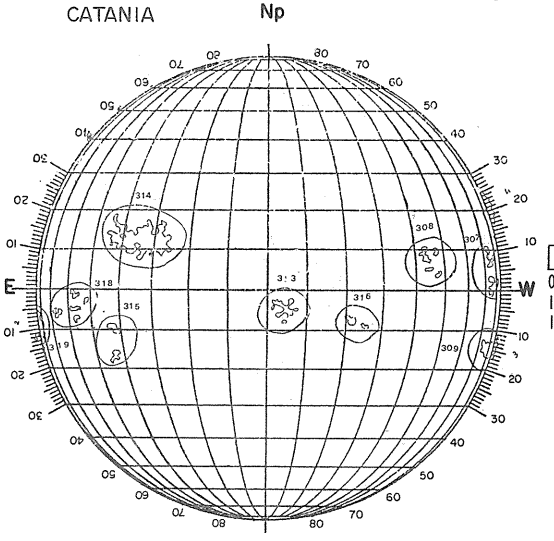


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CATANIA

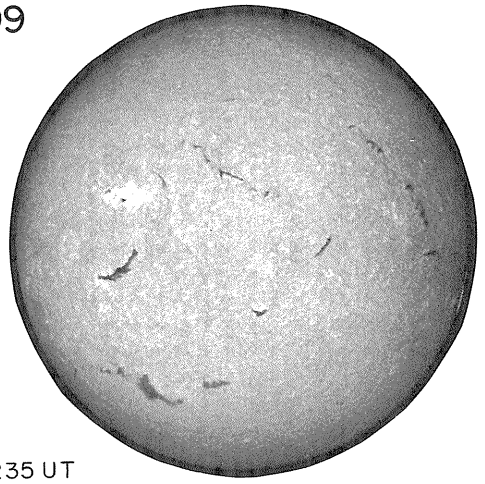
CALCIUM REPORT



POOR	GD
09 - 1681	---
14 - 3843	---
15 - 0234	---

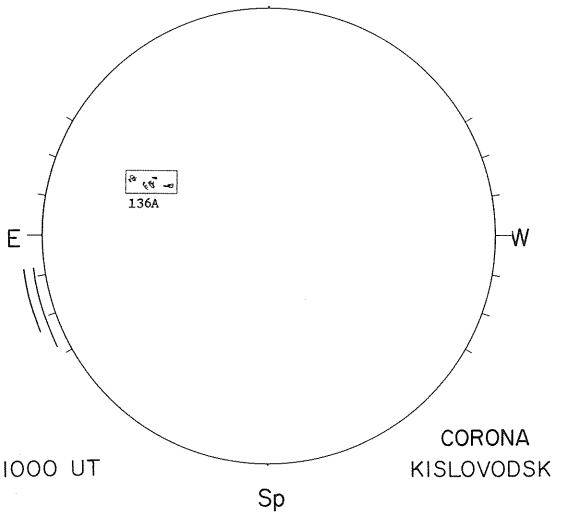
0840 UT

RAMEY AFB
09



1235 UT

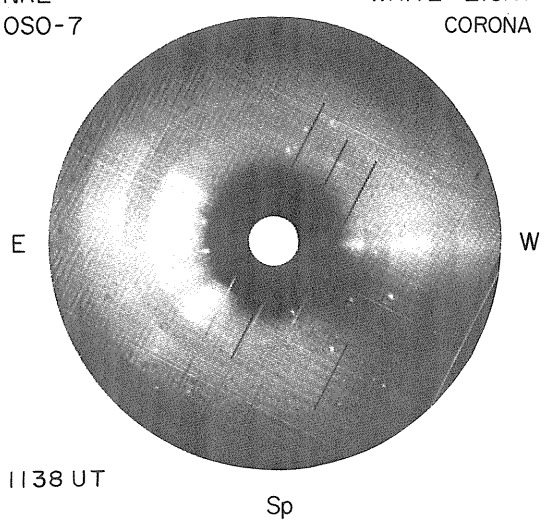
CANARY ISLAND



1000 UT

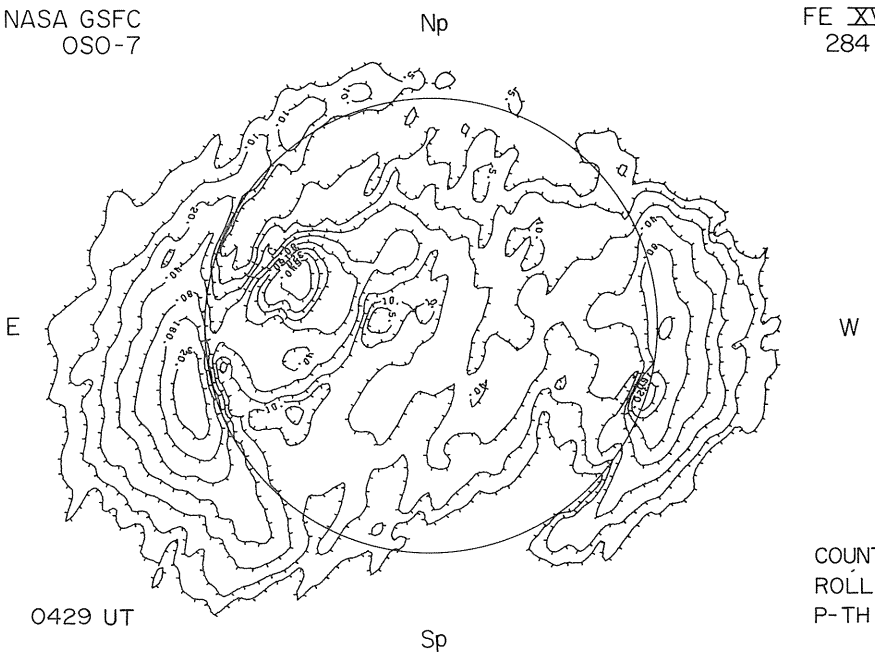
CORONA
KISLOVODSK

NRL
OSO-7



1138 UT

NASA GSFC
OSO-7

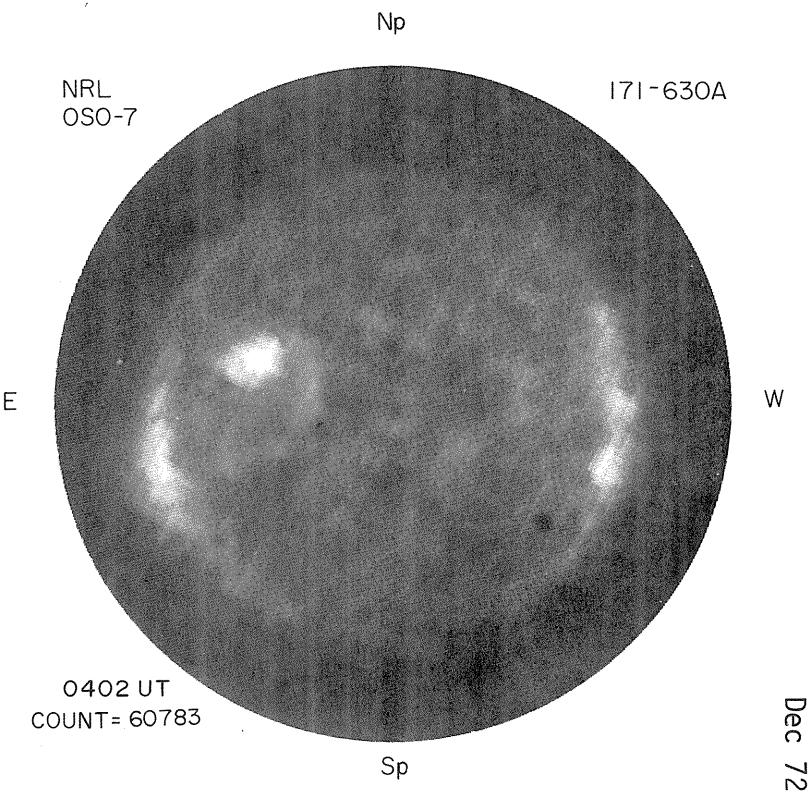


0429 UT

FE XV
284 A

COUNT = 42824
ROLL = 109.9°
P-TH = 7.24

NRL
OSO-7



0402 UT
COUNT = 60783

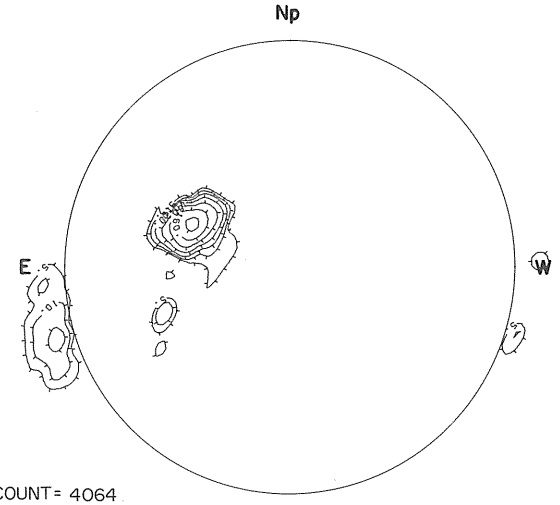
39
Dec 72

DECEMBER 10, 1972 (P= 12.38 B_o= -0.33 L_o= 131.13

40
Dec 72

NASA GSFC
OSO-7

X-RAY



COUNT= 4064
ROLL = 110.0°
P-TH = 7.23

0340 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

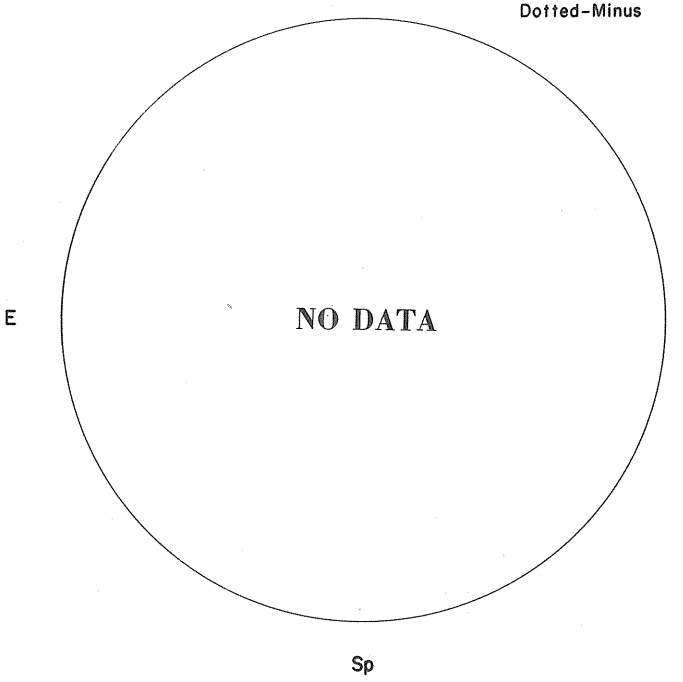
PROSPECT HILL
AFCRL

8.6 mm

Contours in Intervals of 200° K

MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

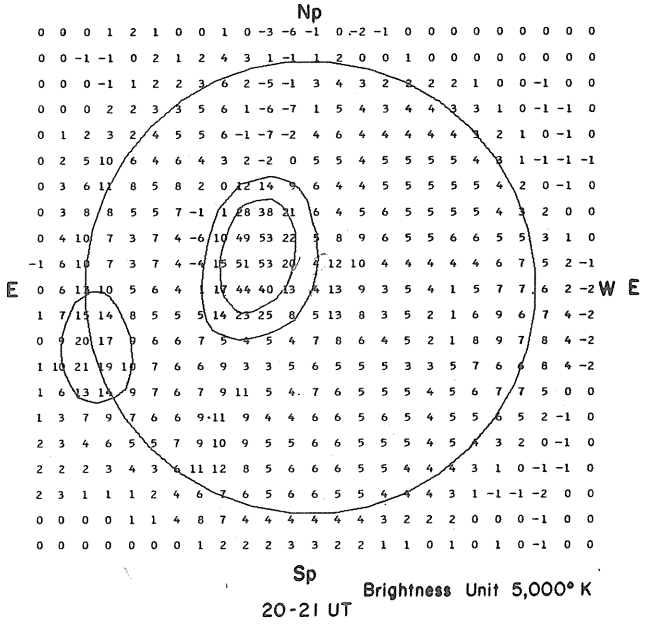


NO DATA

Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

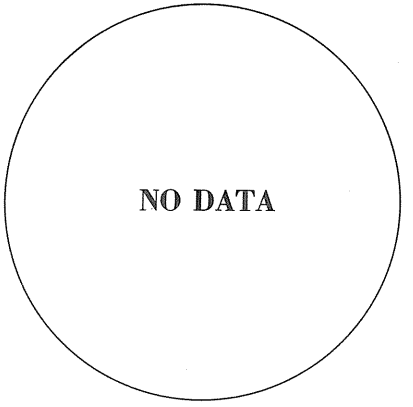


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm



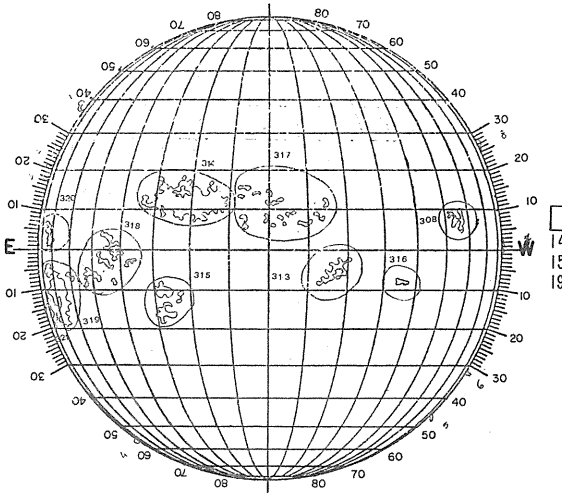
NO DATA

02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

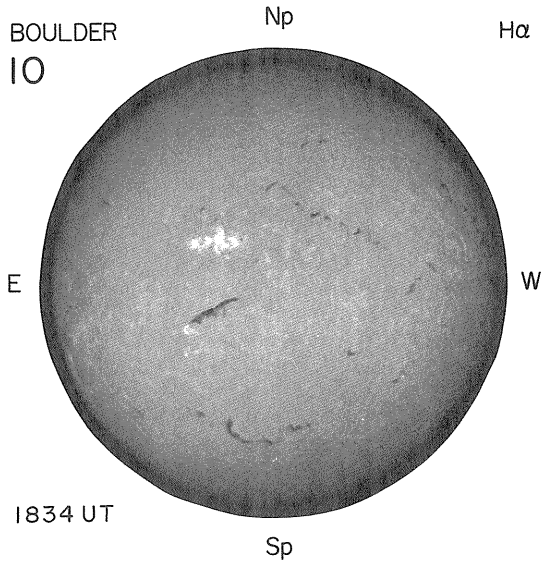
CALCIUM REPORT

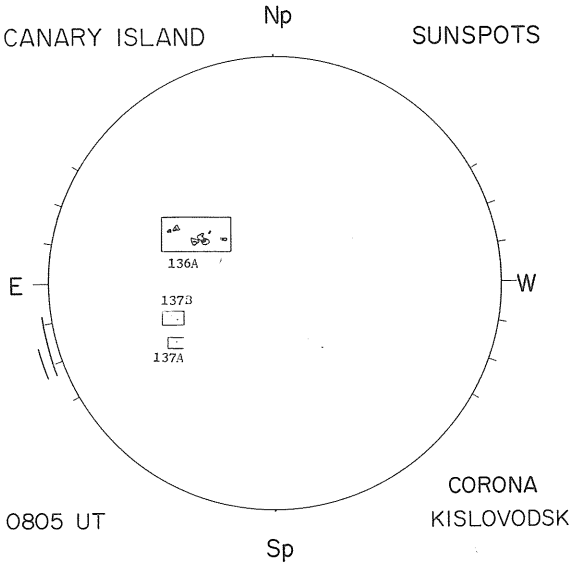
CATANIA

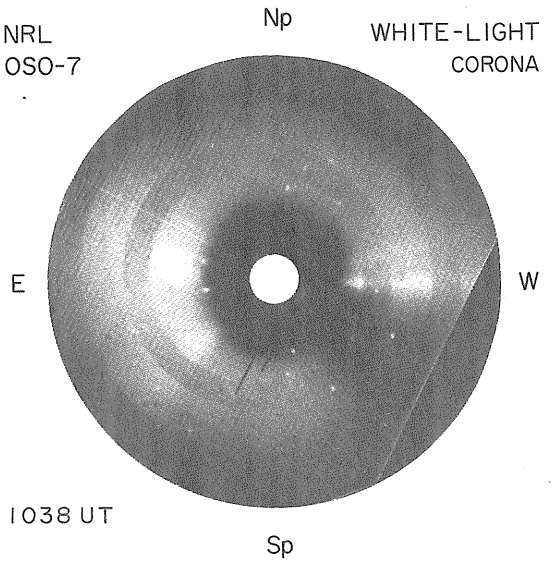


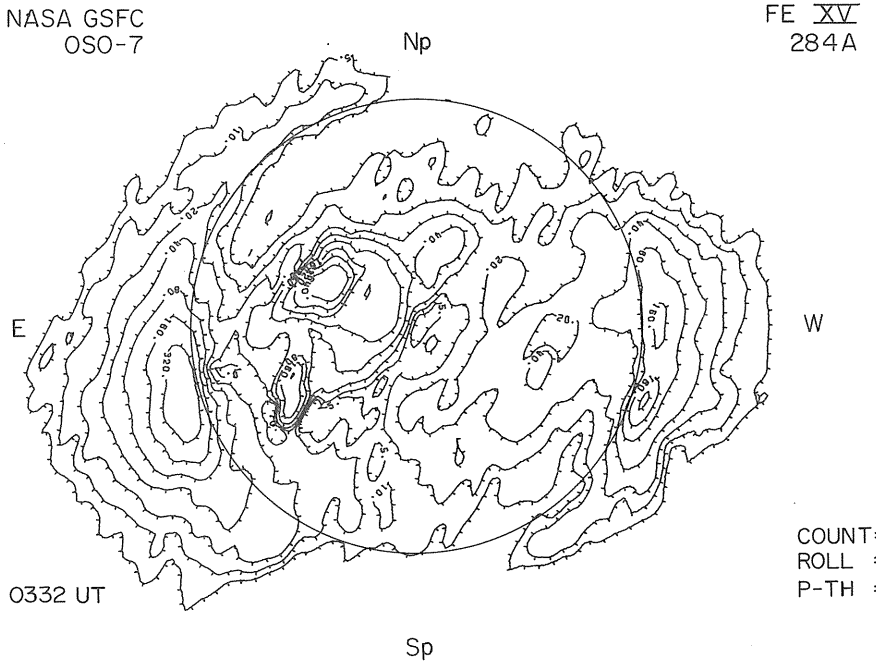
	FAIR	GD
14 - 5680	---	
15 - 1018	---	
19 - 4449	---	

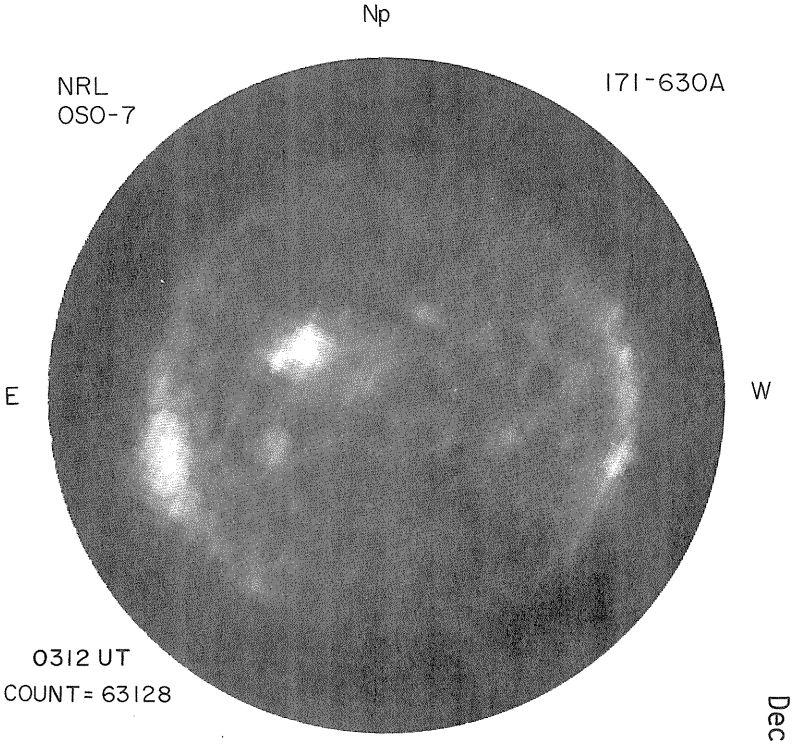
0850 UT


BOULDER
10
Np
Hα
E
W
1834 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
E
W
136A
137B
137A
0805 UT
Sp
CORONA
KISLOVODSK


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
1038 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
0332 UT
Sp
COUNT= 46045
ROLL = 110.5°
P-TH = 7.23

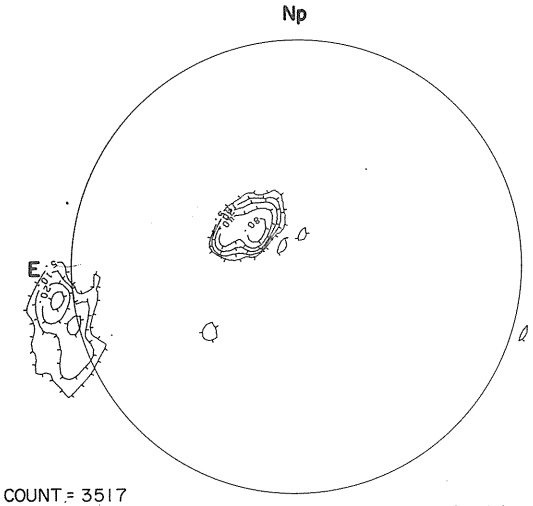

Np
NRL
OSO-7
171-630A
E
W
0312 UT
COUNT= 63128

DECEMBER 11, 1972 (P= 11.94 B_o= -0.46 L_o= 117.96

42
Dec 72

NASA GSFC
OSO-7

X-RAY



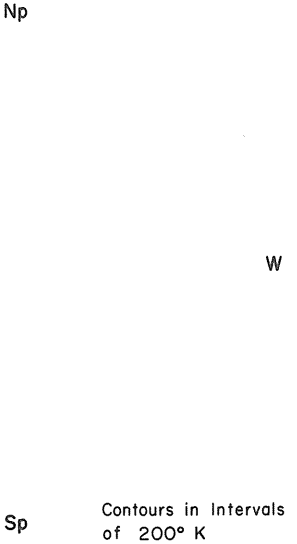
COUNT = 3517
ROLL = 109.8°
P-TH = 7.23

0028 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

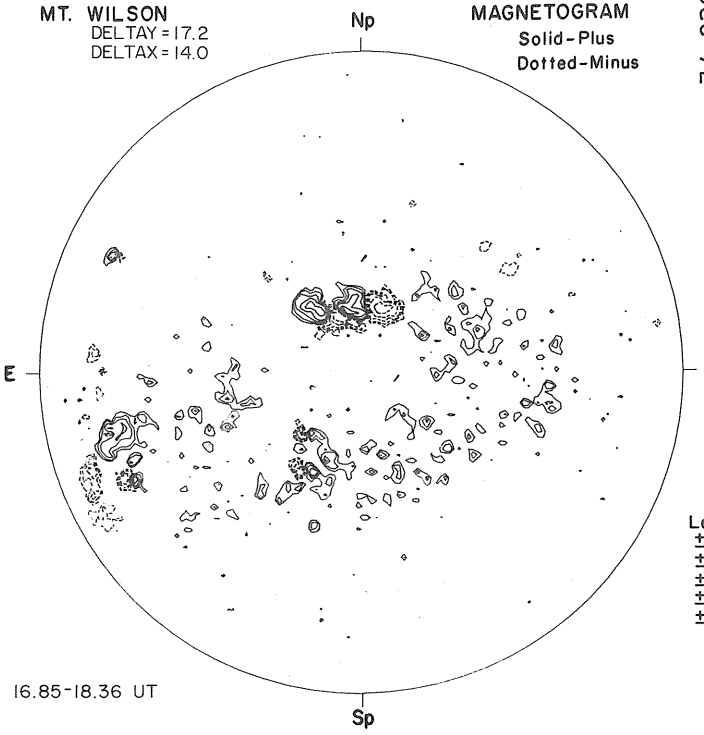
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.2
DELTAX = 14.0

MAGNETOGRAM
Solid-Plus
Dotted-Minus

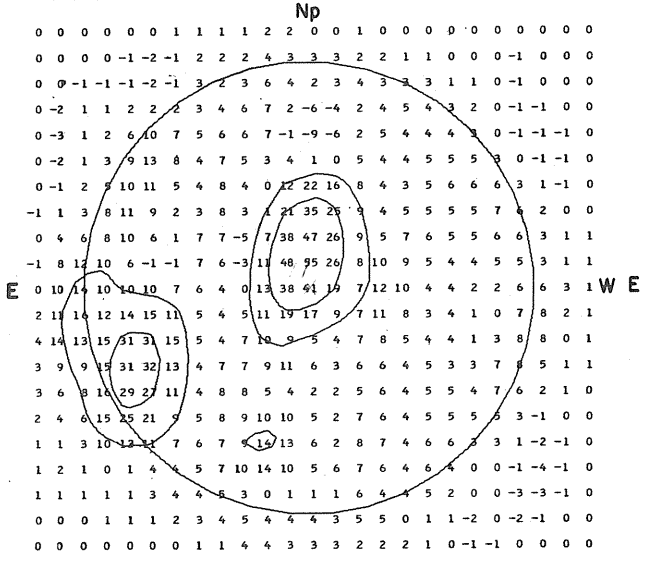


Levels
±5
±10
±20
±40
±80

16.85-18.36 UT

STANFORD

9.1 cm

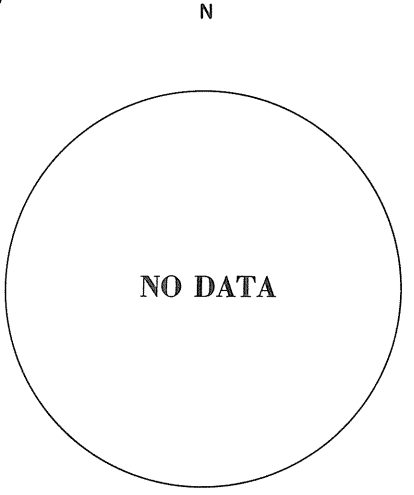


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

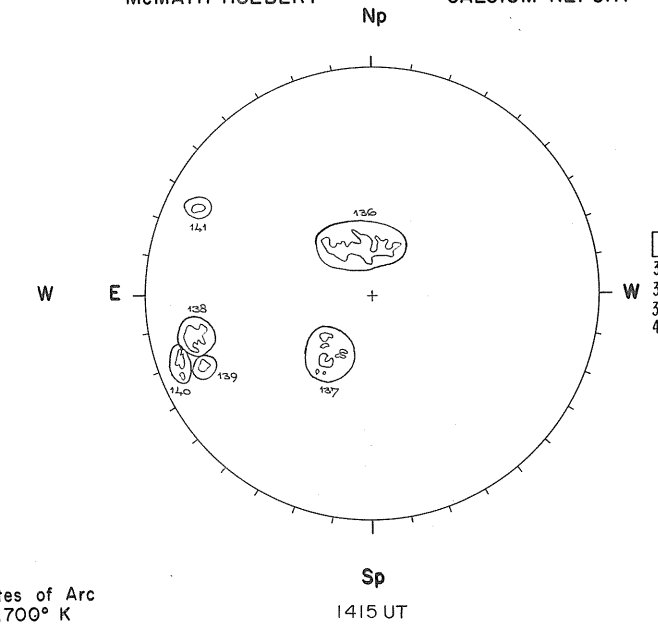


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

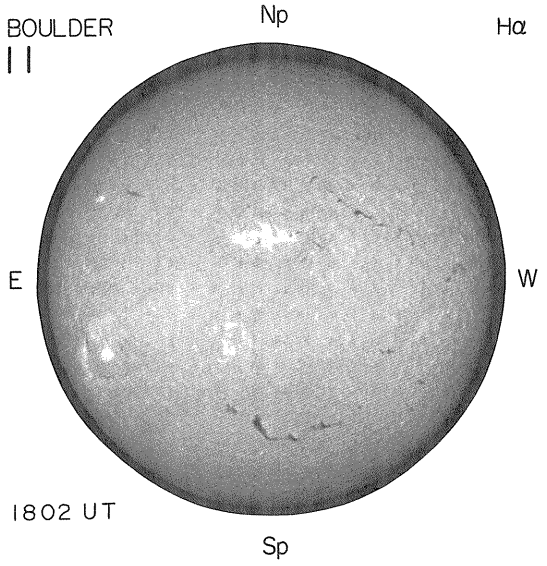
McMATH-HULBERT

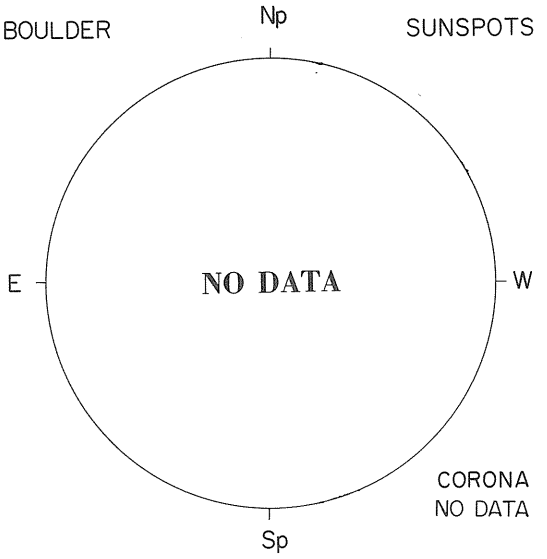
CALCIUM REPORT

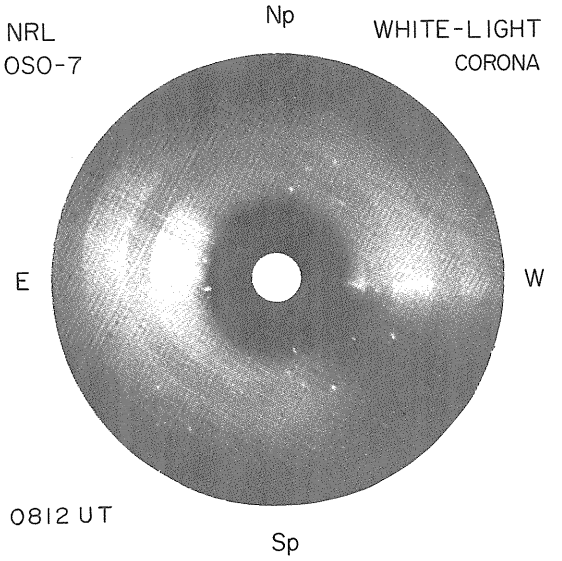


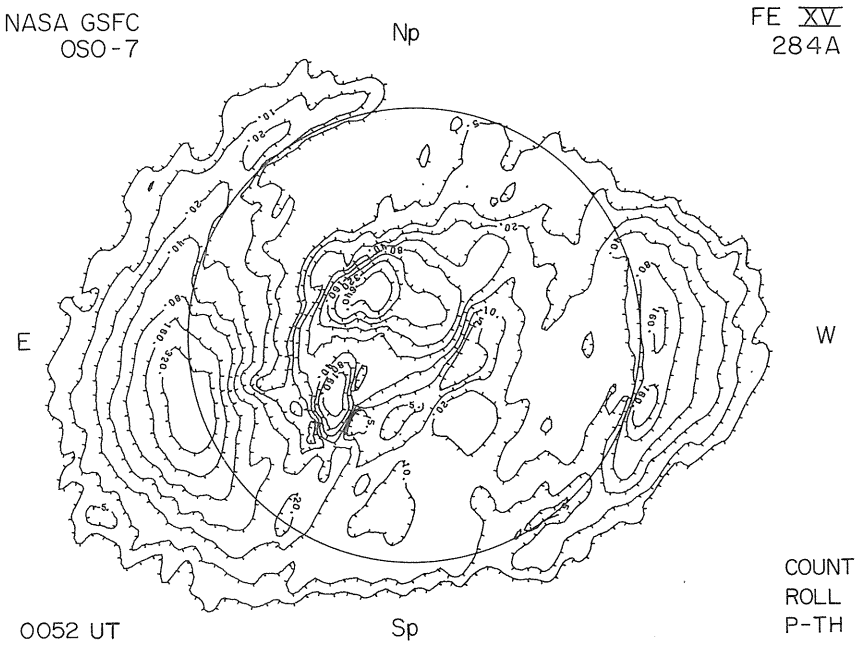
POOR	D
36-3200	-3.5
37-0900	-2.5
39-0700	-3.5
41-0500	-3.5

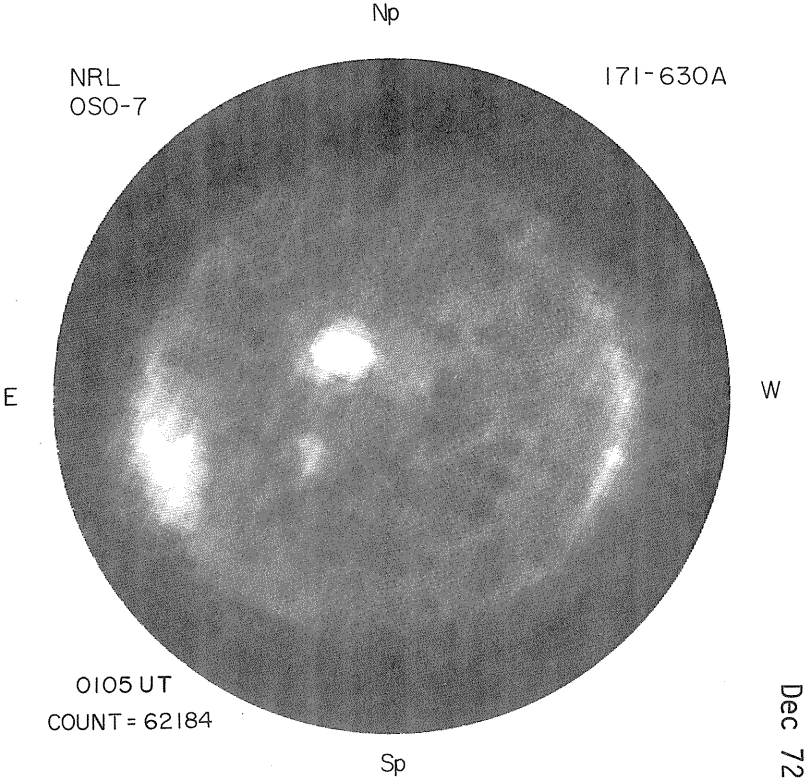
1415 UT


BOULDER
Np
Hα
E
W
1802 UT
Sp


BOULDER
Np
SUNSPOTS
E
NO DATA
W
CORONA
NO DATA
Sp


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
0812 UT
Sp

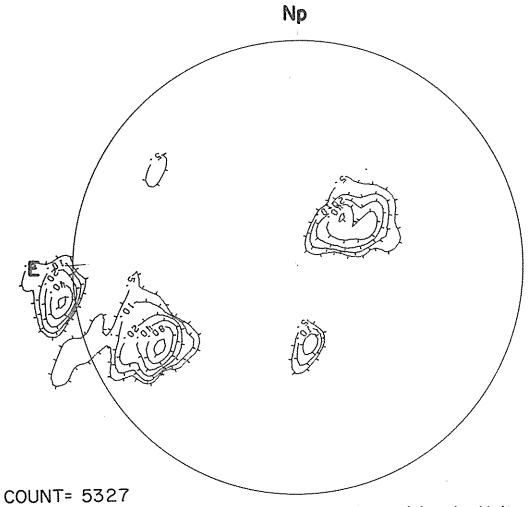

NASA GSFC
OSO-7
Np
FE XV
284A
E
W
0052 UT
Sp
COUNT = 50178
ROLL = 109.8°
P-TH = 7.23


Np
NRL
OSO-7
171-630A
E
W
0105 UT
COUNT = 62184
Sp

DECEMBER 12, 1972 (P= 11.50 B_o = -0.59 L_o = 104.78

NASA GSFC
OSO-7

X-RAY



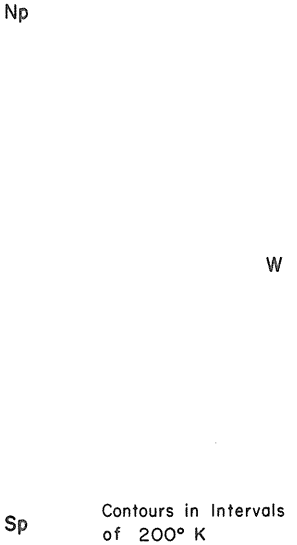
COUNT= 5327
ROLL = 108.6°
P-TH = 7.21

1940 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

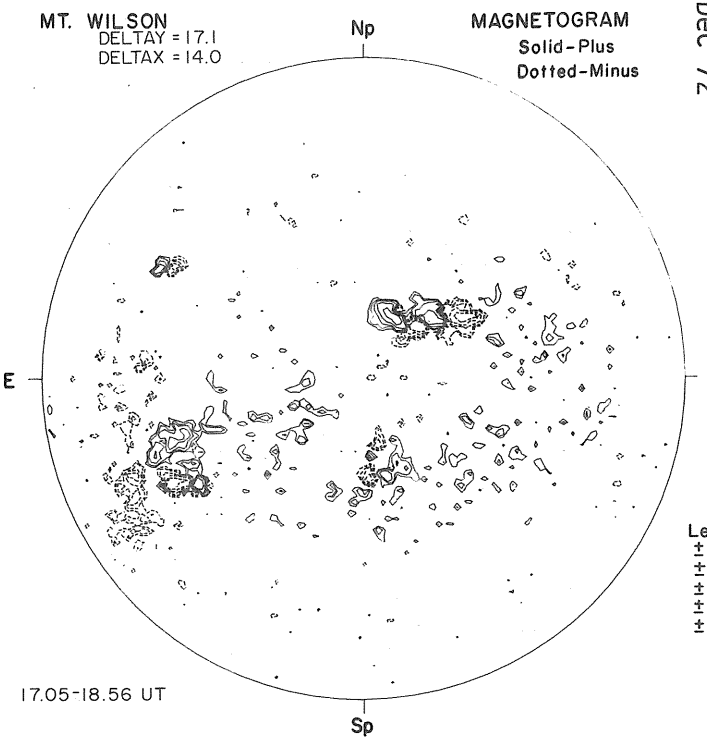
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.1
DELTAX = 14.0

MAGNETOGRAM
Solid-Plus
Dotted-Minus

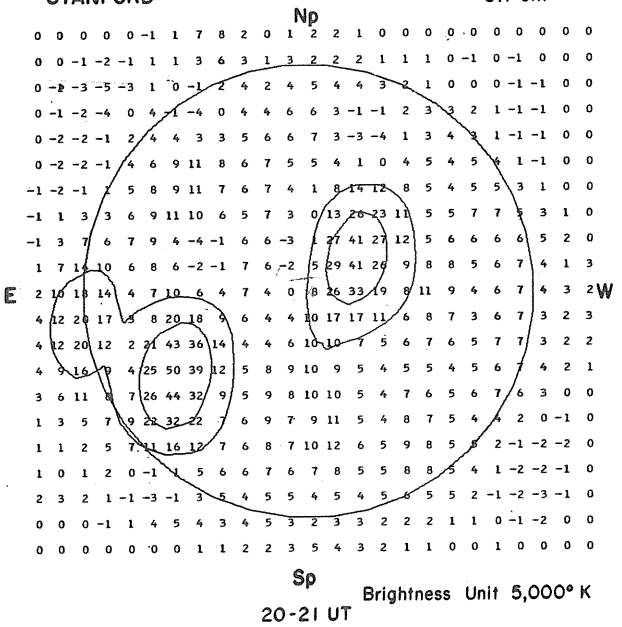


Levels
±5
±10
±20
±40
±80

17.05-18.56 UT

STANFORD

9.1 cm

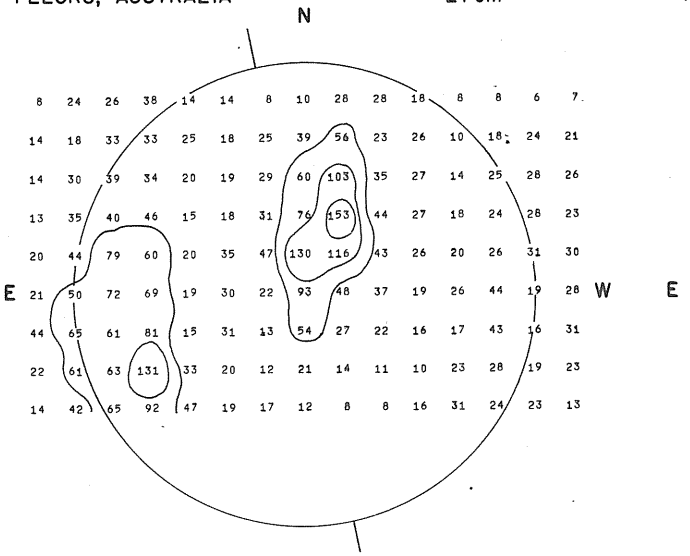


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

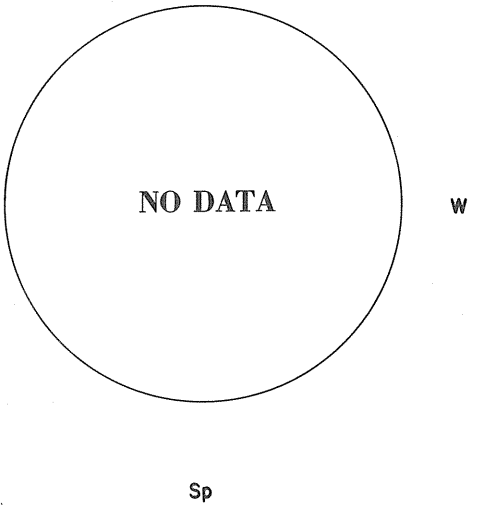


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

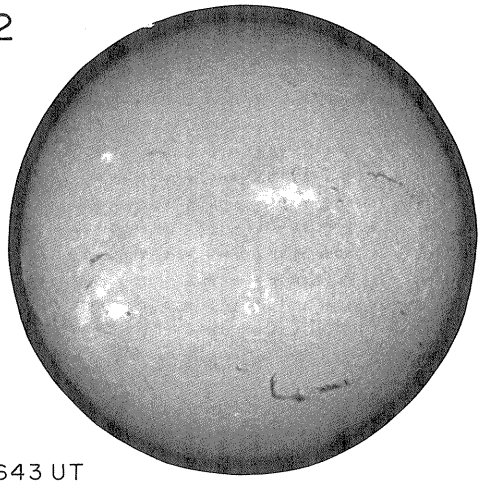
McMATH-HULBERT

CALCIUM REPORT



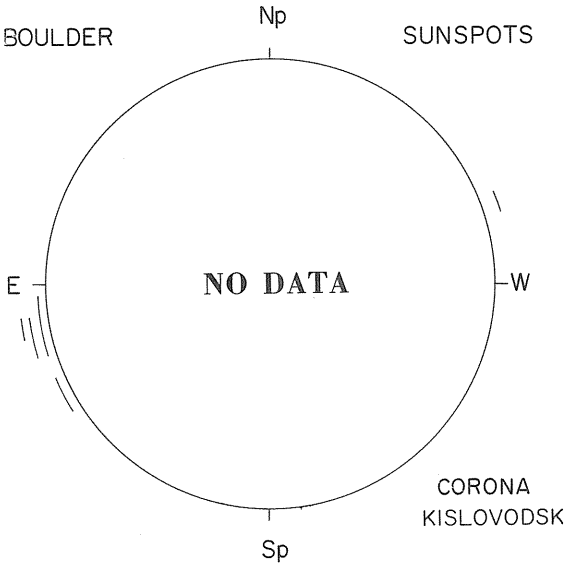
NO DATA

BOULDER
12



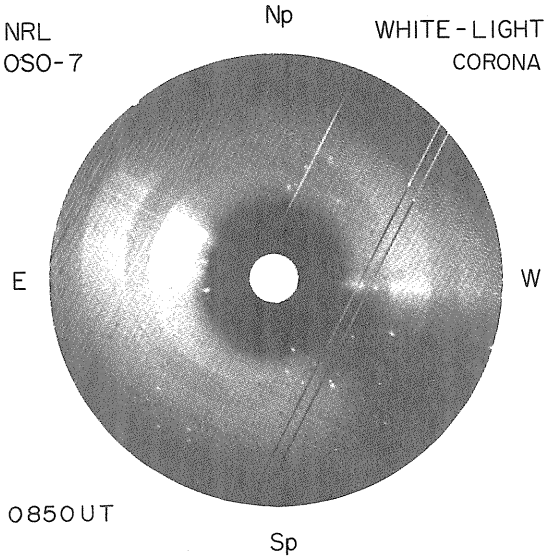
1643 UT

BOULDER



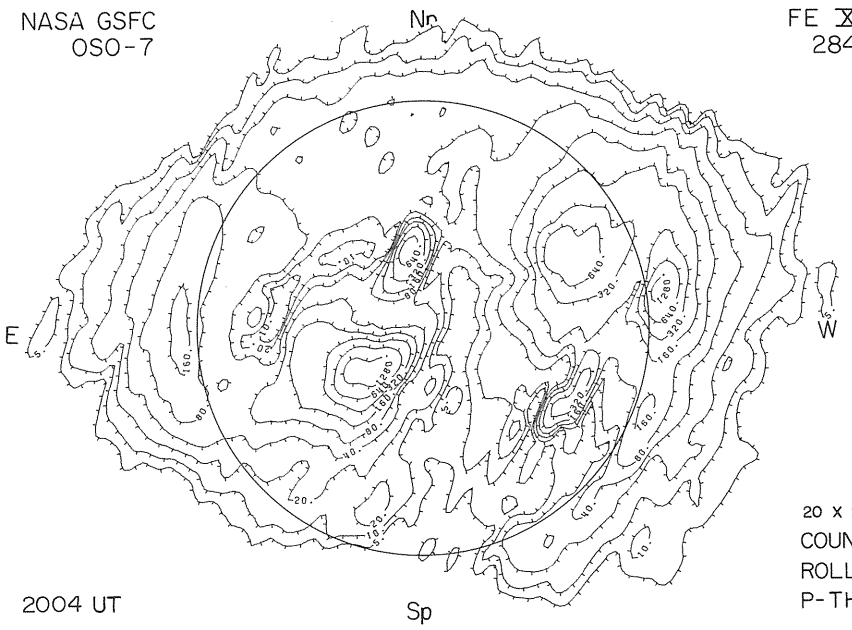
CORONA
KISLOVODSK

NRL
OSO-7



0850 UT

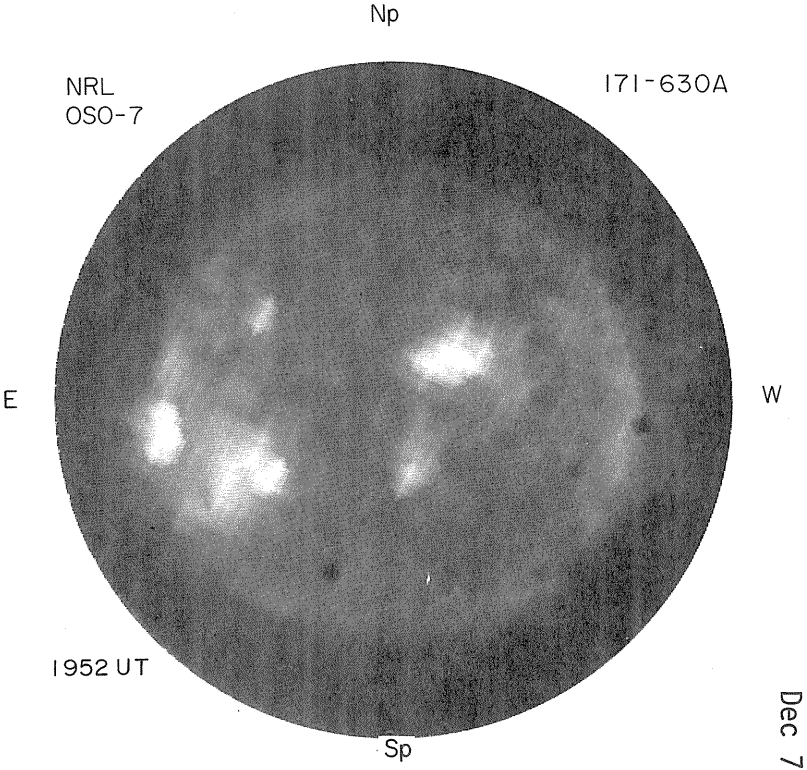
NASA GSFC
OSO-7



2004 UT

20 X 20 ARCSEC APERTURE
COUNT = 109231
ROLL = 108.6°
P-TH = 7.21

NRL
OSO-7

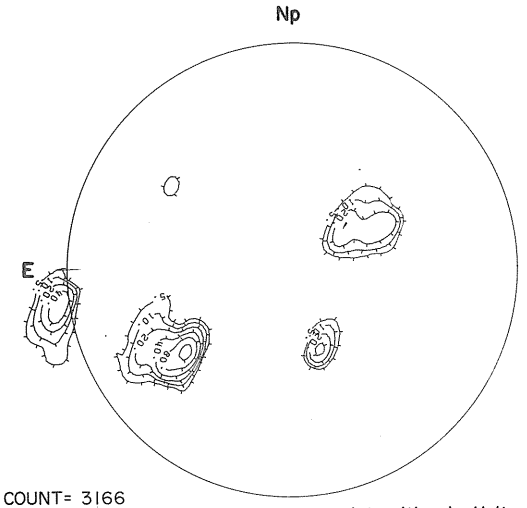


1952 UT

DECEMBER 13, 1972 (P= 11.06 B_o = -0.72 L_o = 91.60

NASA GSFC
OSO-7

X-RAY



COUNT= 3166
ROLL = 106.9°
P-TH = 7.21

0517 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

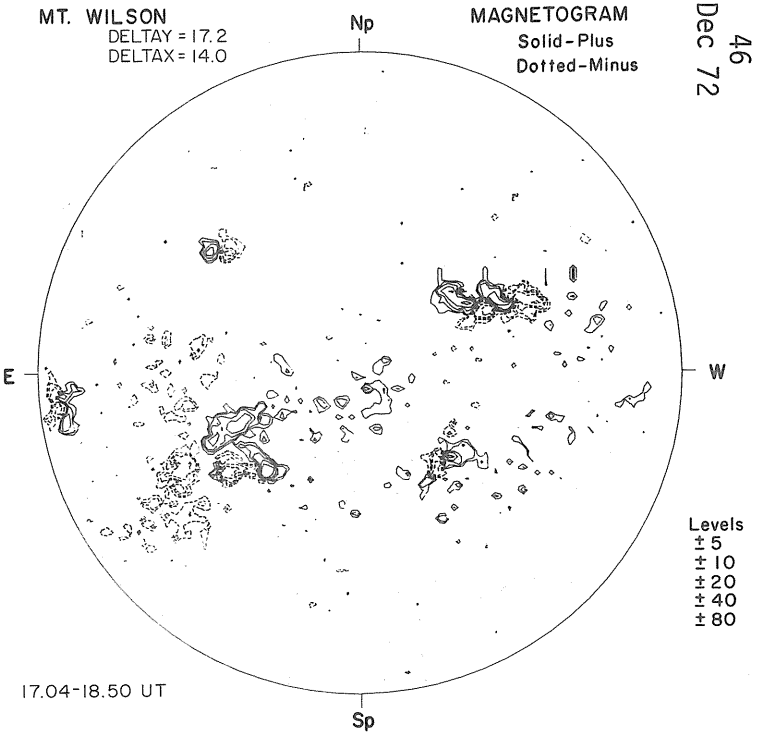
PROSPECT HILL
AFCRL

8.6 mm

Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.2
DELTAX = 14.0

MAGNETOGRAM
Solid-Plus
Dotted-Minus

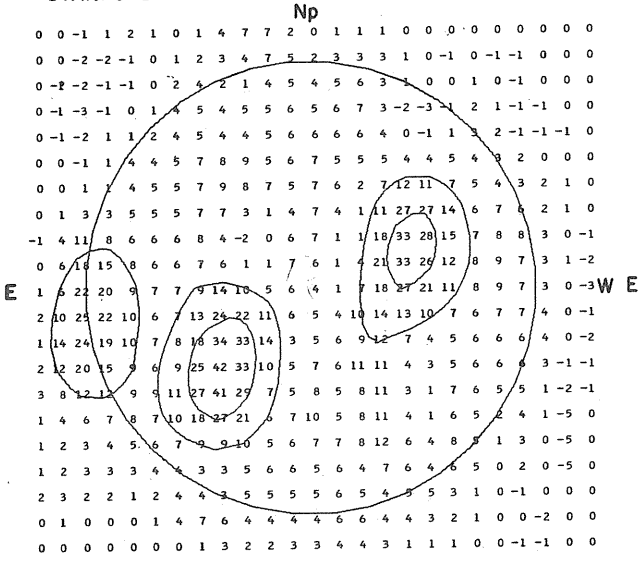


Levels
±5
±10
±20
±40
±80

17.04-18.50 UT

STANFORD

9.1 cm

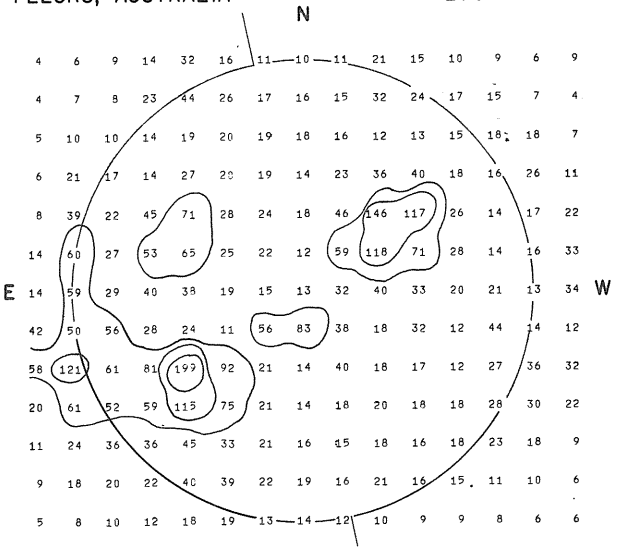


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

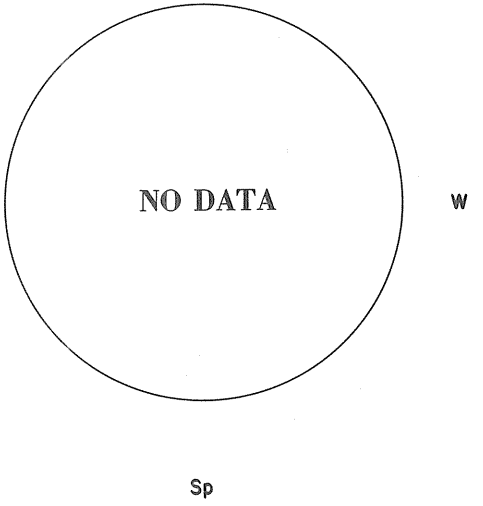


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

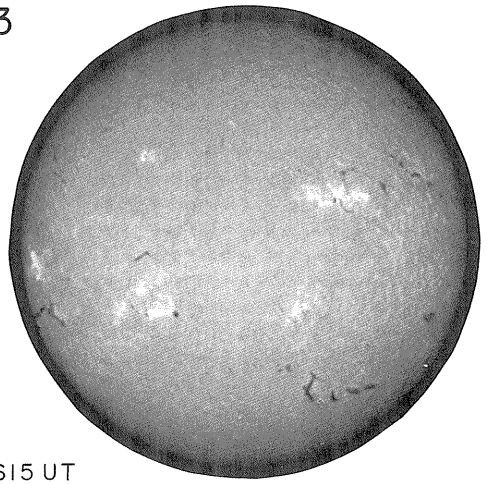
McMATH-HULBERT

CALCIUM REPORT



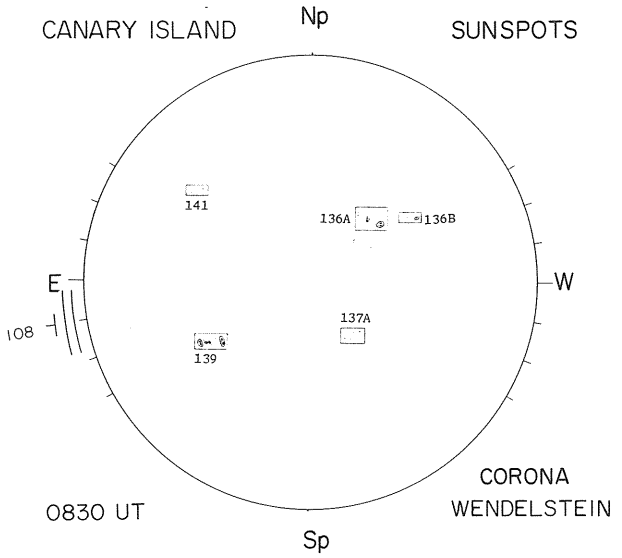
NO DATA

BOULDER
13



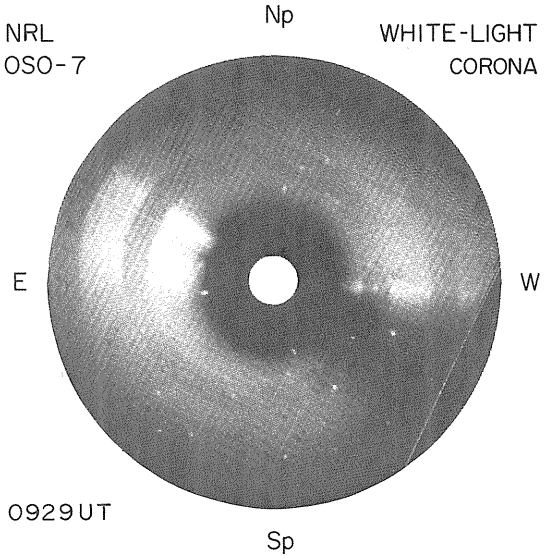
1615 UT

CANARY ISLAND



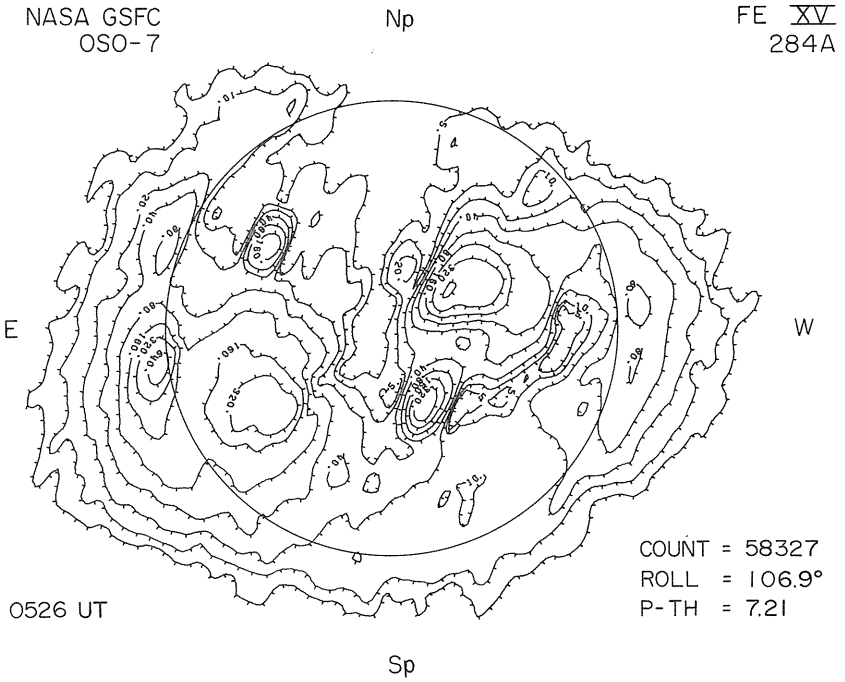
0830 UT

NRL
OSO-7



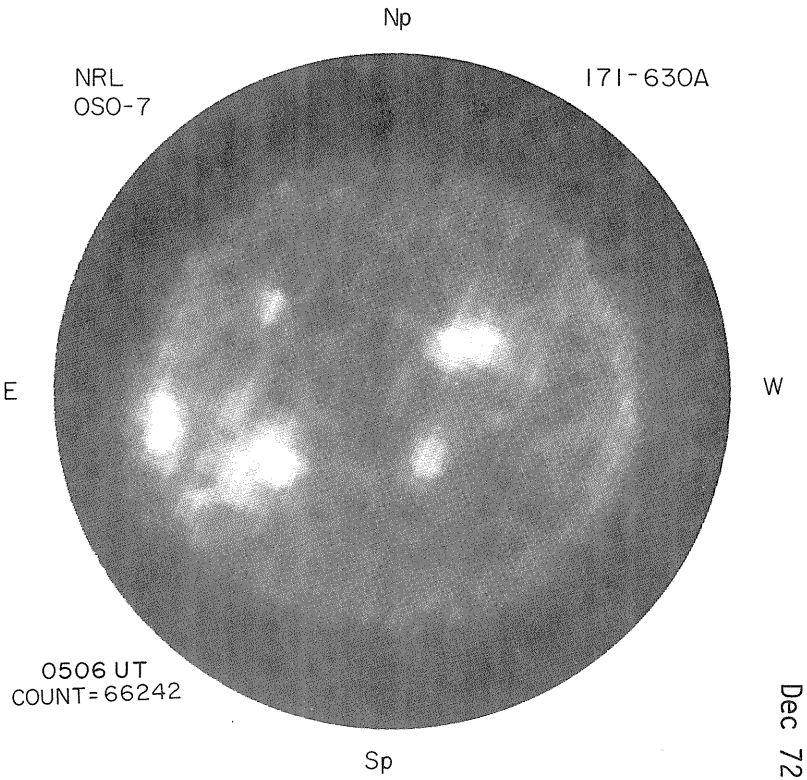
0929 UT

NASA GSFC
OSO-7



0526 UT

NRL
OSO-7

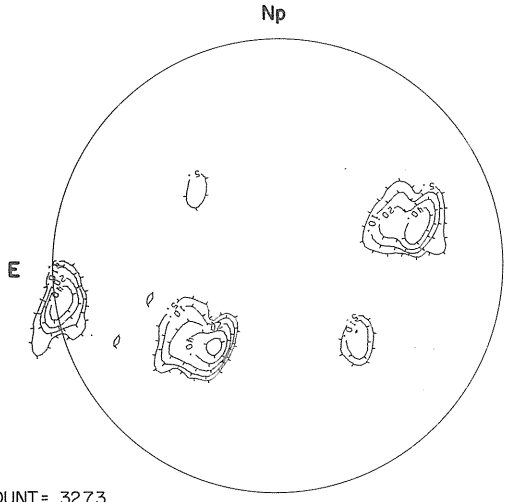


0506 UT
COUNT=66242

DECEMBER 14, 1972 (P= 10.61 B_o= -0.85 L_o= 78.43

NASA GSFC
OSO-7

X-RAY



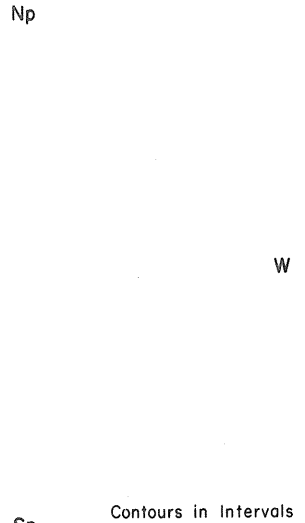
COUNT= 3273
ROLL = 106.9°
P-TH = 7.19

0413 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

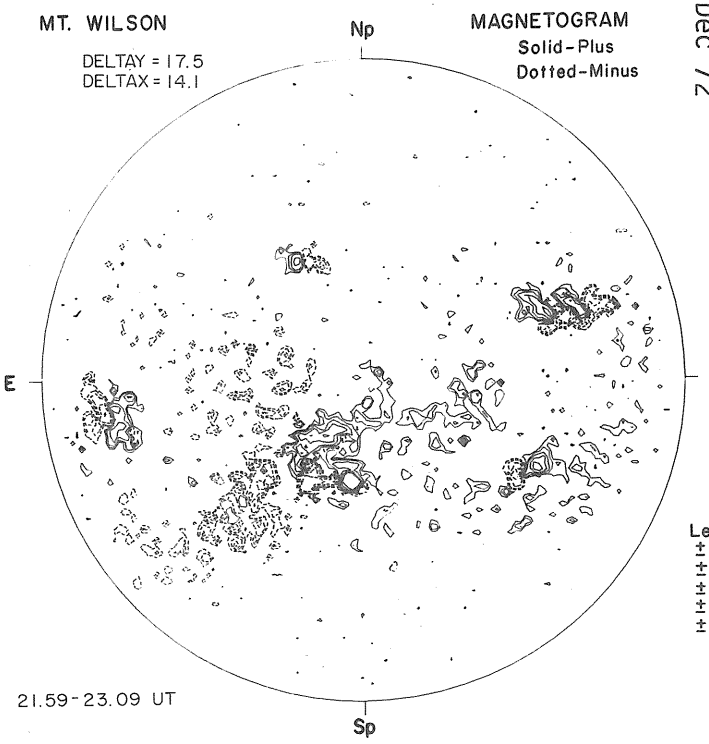


Contours in Intervals of 200° K

MT. WILSON

DELTAY = 17.5
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

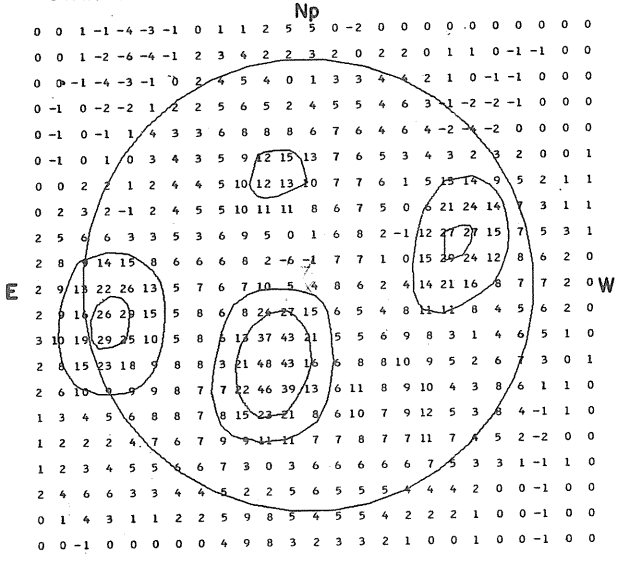
21.59-23.09 UT

McMATH-HULBERT

CALCIUM REPORT

STANFORD

9.1 cm

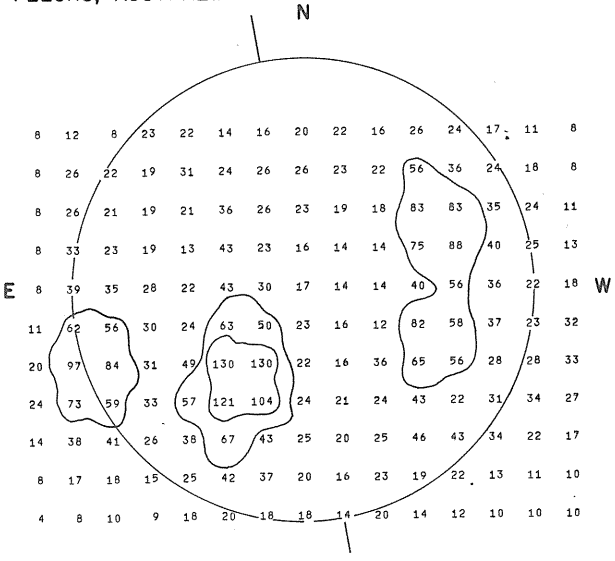


20-21 UT

Brightness Unit 5,000° K

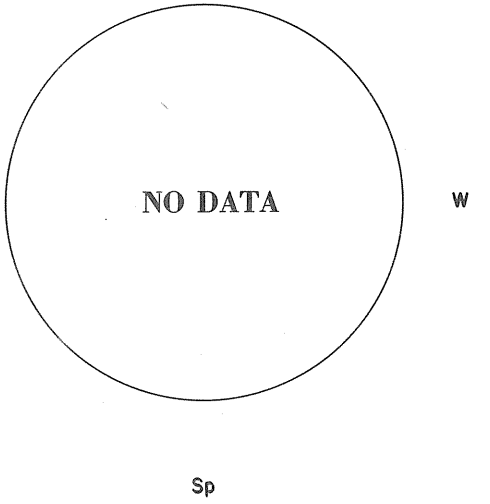
FLEURS, AUSTRALIA

21 cm

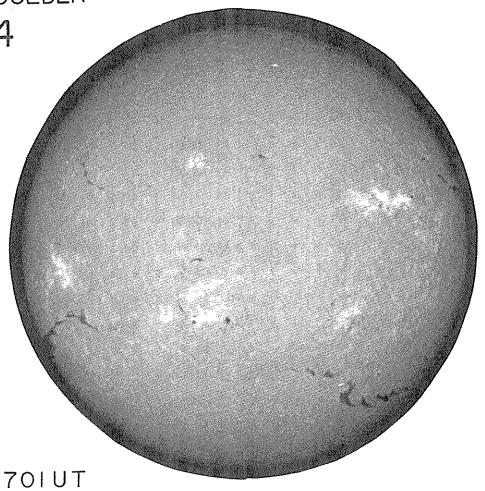


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

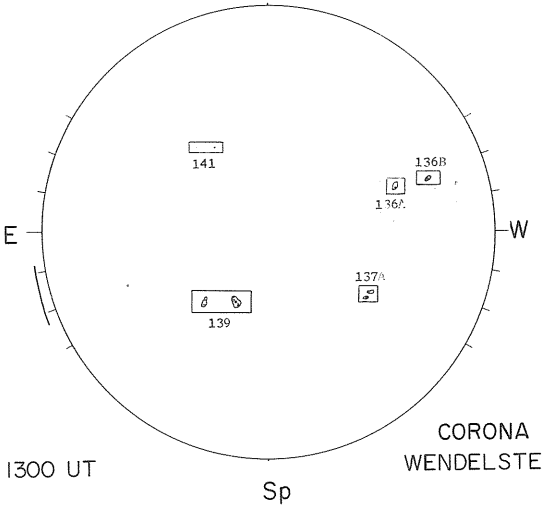


BOULDER
14



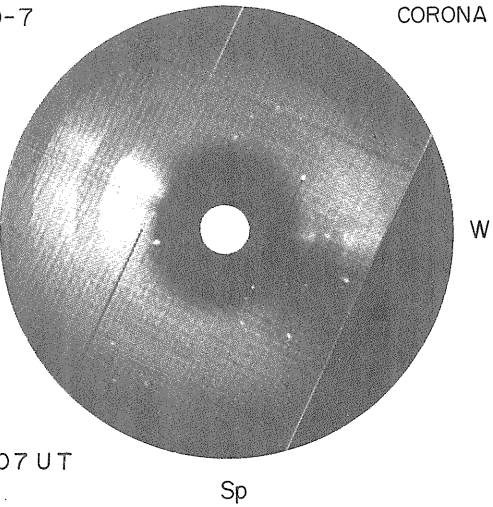
1701 UT

CANARY ISLAND



1300 UT

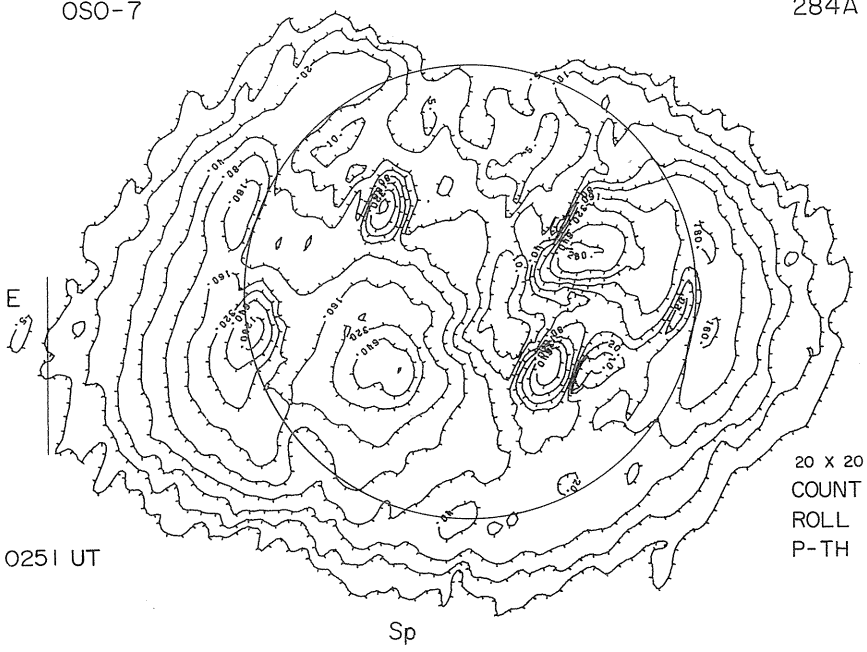
NRL
OSO-7



CORONA
WENDELSTEIN

1007 UT

NASA GSFC
OSO-7

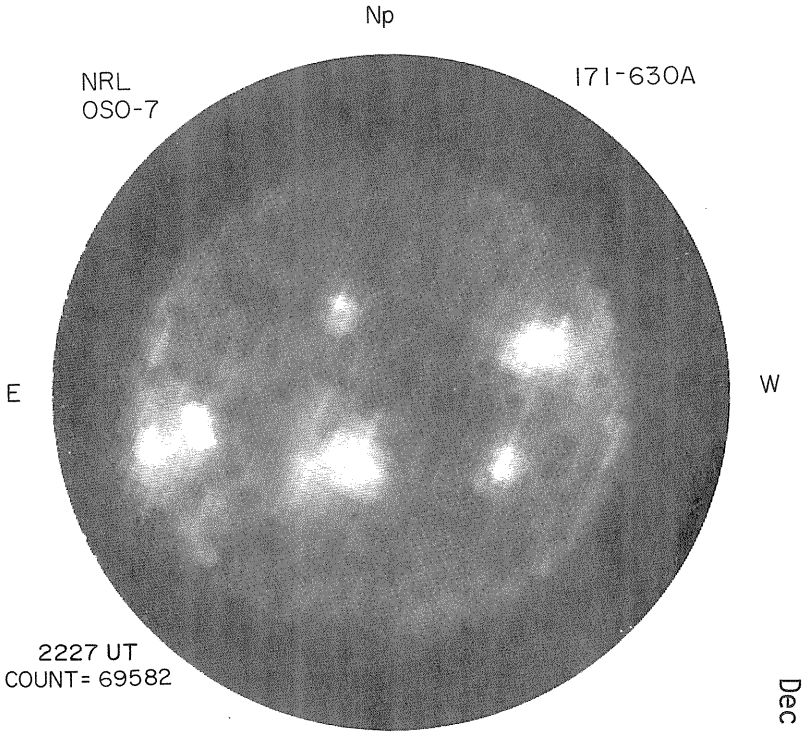


FE XV
284A

0251 UT

20 X 20 ARCSEC APERTURE
COUNT = 122518
ROLL = 106.9°
P-TH = 7.19

NRL
OSO-7

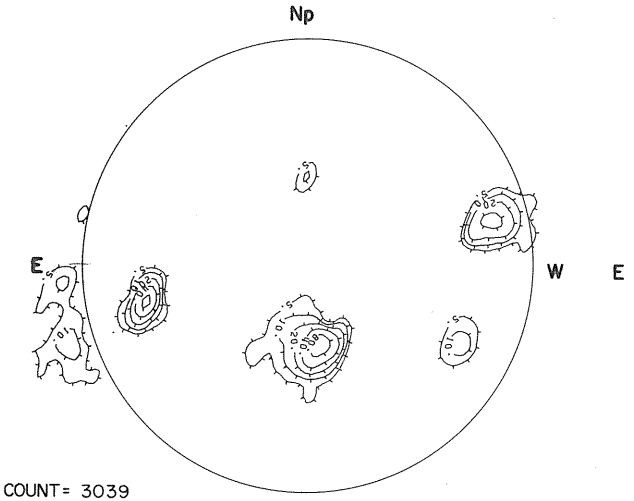


2227 UT
COUNT = 69582

DECEMBER 15, 1972 (P= 10.16 B_o = -0.97 L_o = 65.25

NASA GSFC
OSO-7

X-RAY



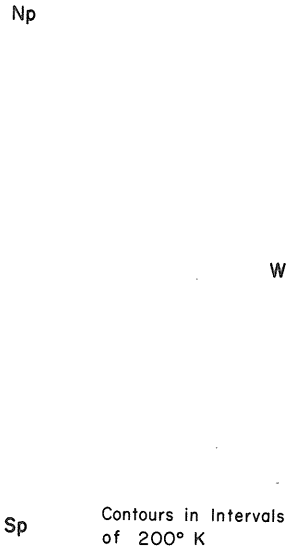
COUNT = 3039
ROLL = 106.8°
P-TH = 7.16

2012 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

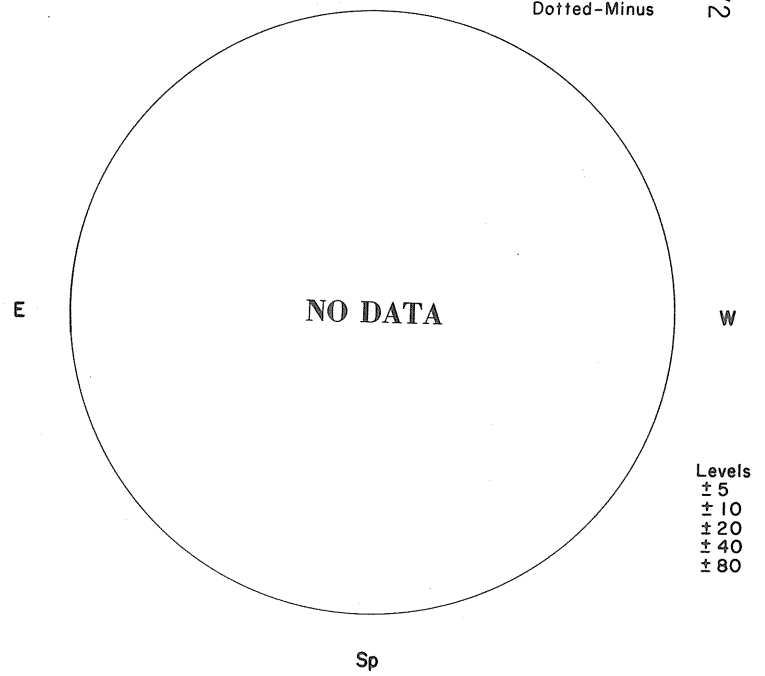
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

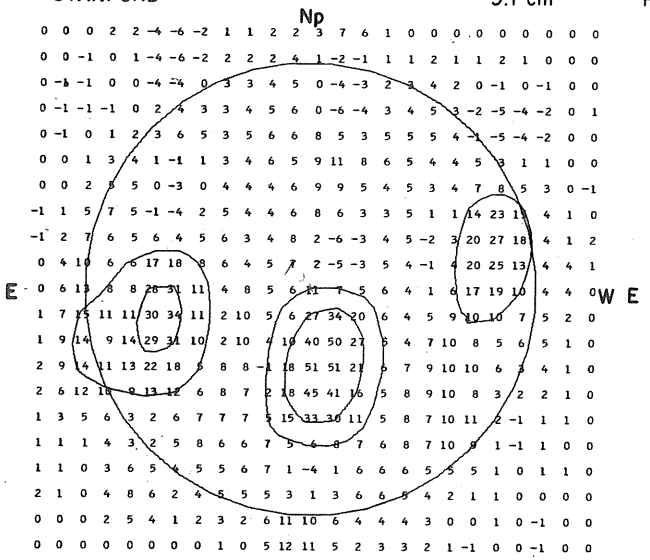
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

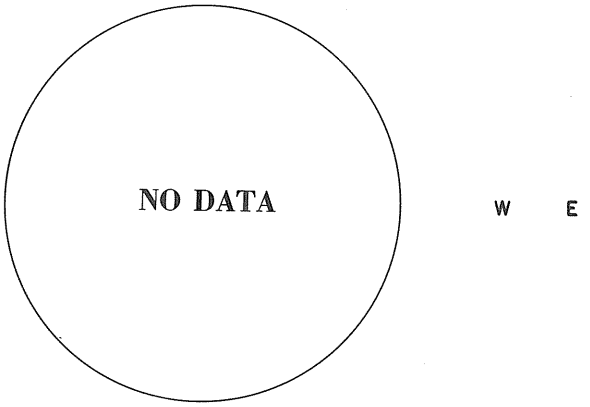


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

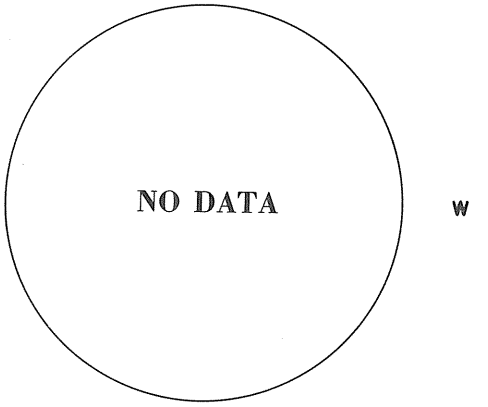


02-03 UT

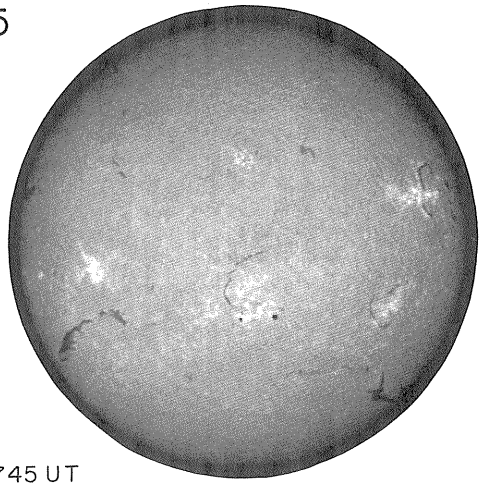
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

CALCIUM REPORT

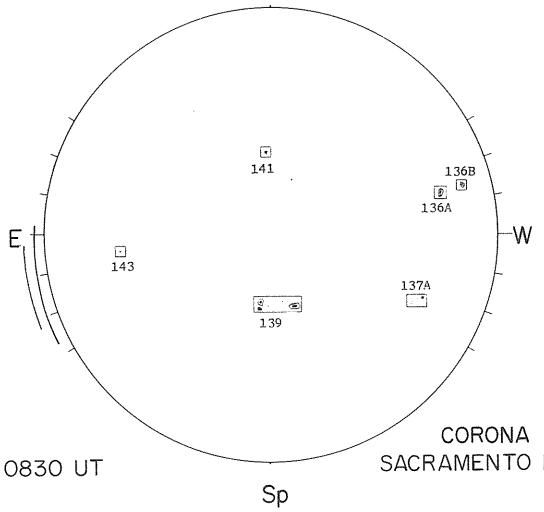


BOULDER
15



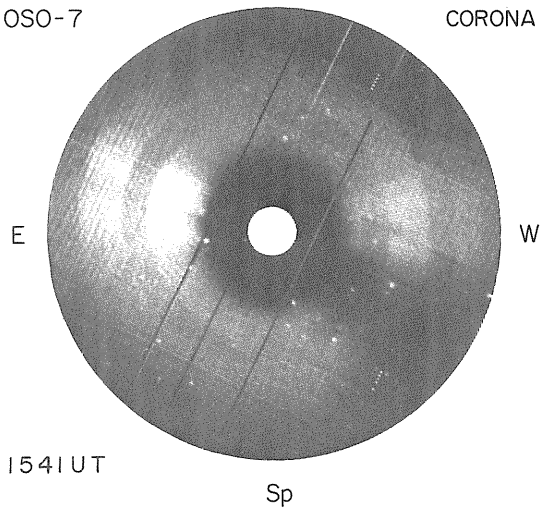
1745 UT

CANARY ISLAND



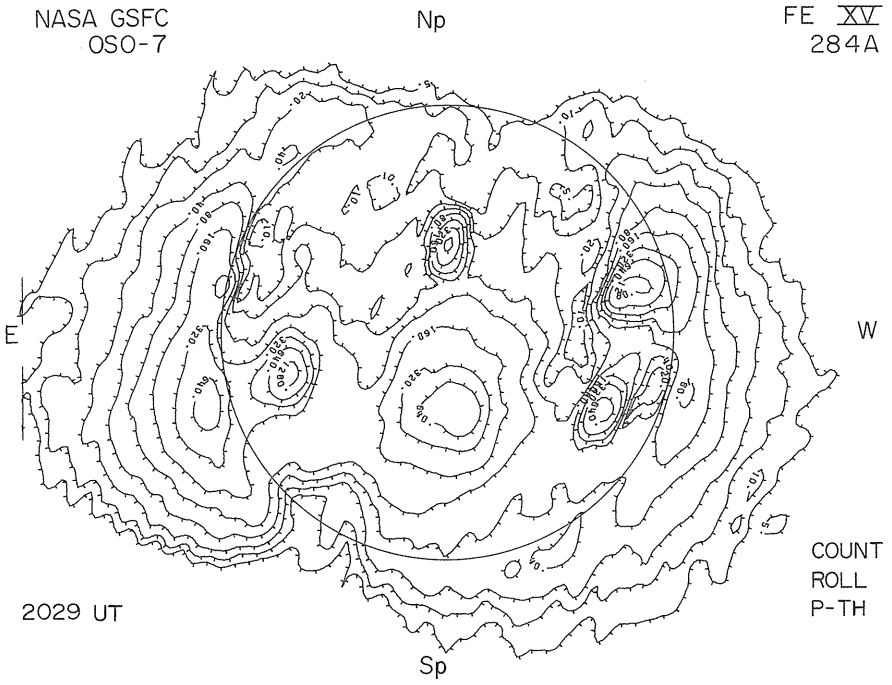
0830 UT

NRL
OSO-7



CORONA
SACRAMENTO PEAK 1541 UT

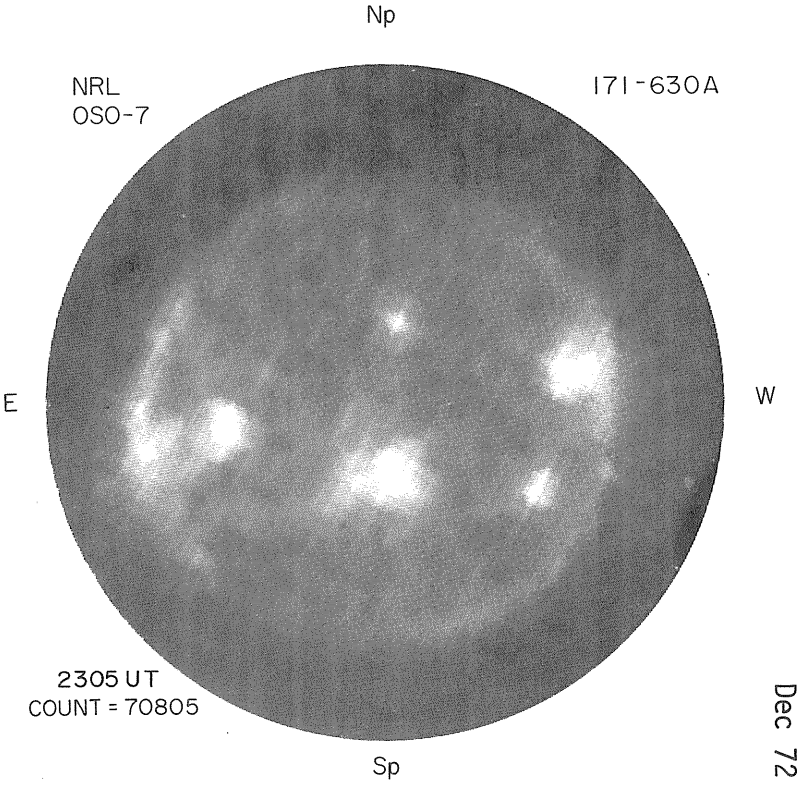
NASA GSFC
OSO-7



COUNT = 122379
ROLL = 106.8°
P-TH = 7.16

2029 UT

NRL
OSO-7

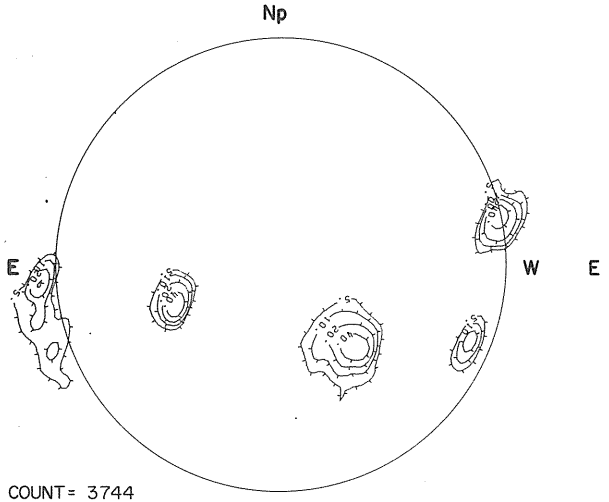


2305 UT
COUNT = 70805

DECEMBER 16, 1972 (P = 9.70 B_o = -1.10 L_o = 52.08

NASA GSFC
OSO-7

X-RAY



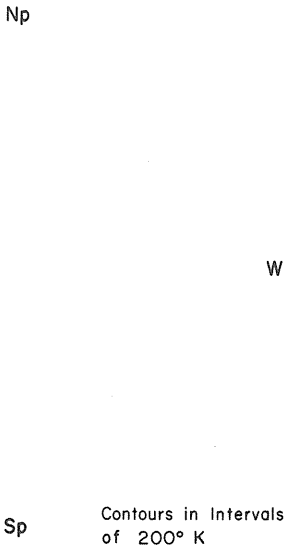
COUNT = 3744
ROLL = 106.9°
P-TH = 7.15

2042 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

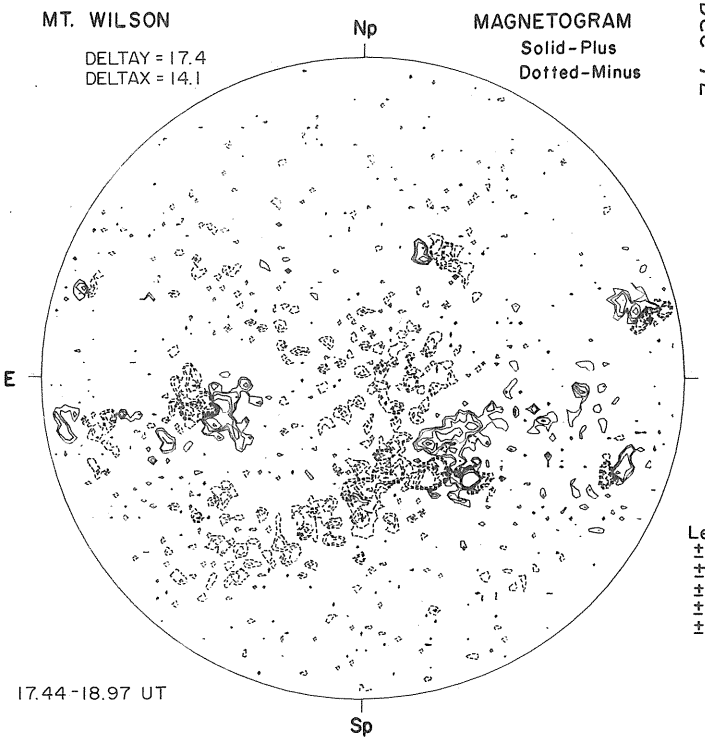


Contours in Intervals of 200° K

MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTAY = 17.4
DELTAX = 14.1

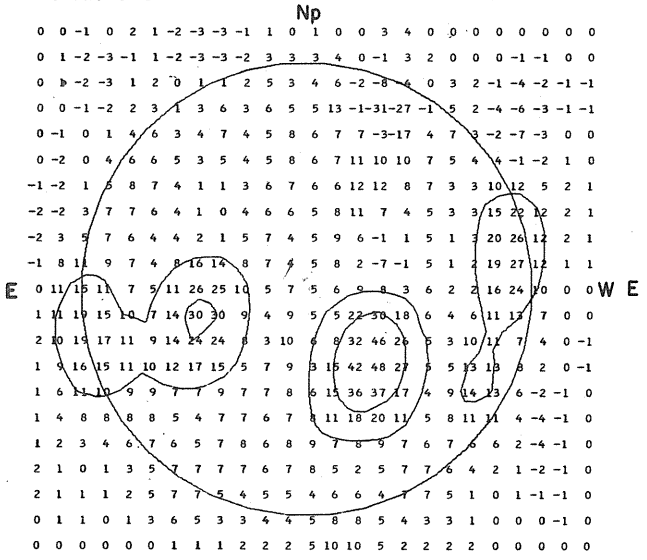


Levels
±5
±10
±20
±40
±80

17.44-18.97 UT

STANFORD

9.1 cm

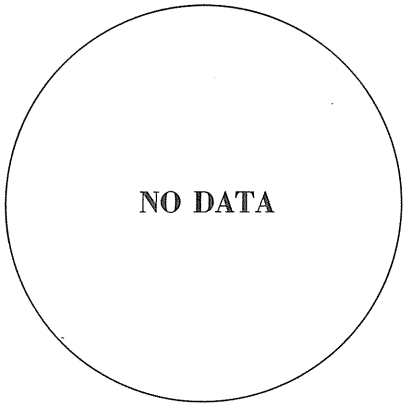


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

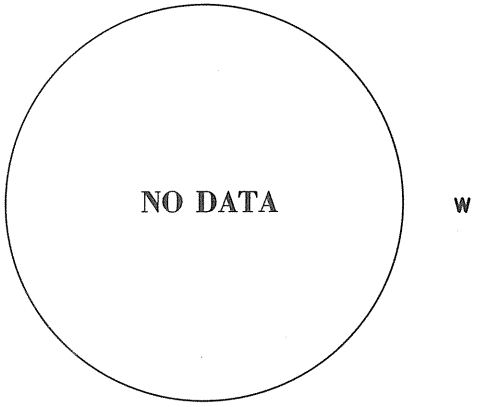


02-03 UT

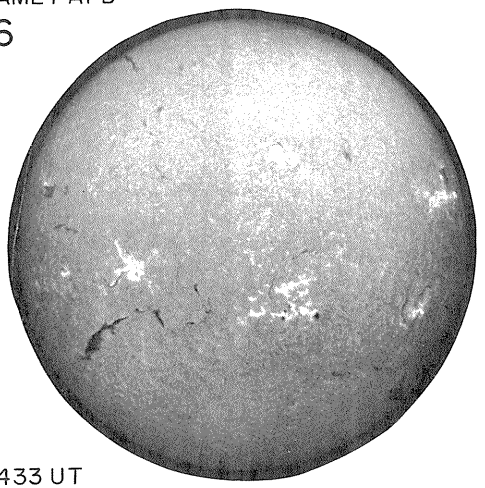
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

CALCIUM REPORT

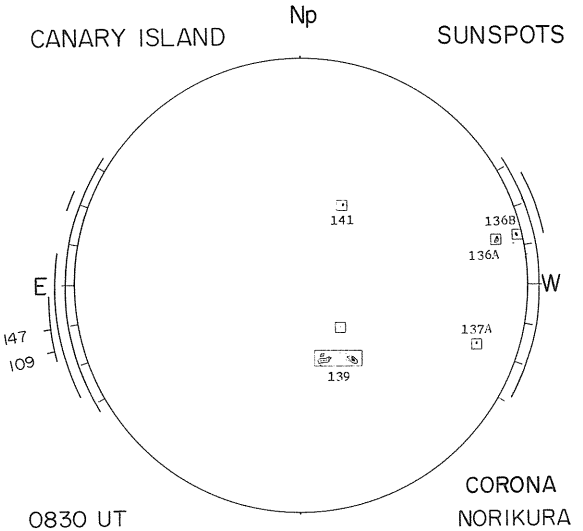


RAMEY AFB
16



1433 UT

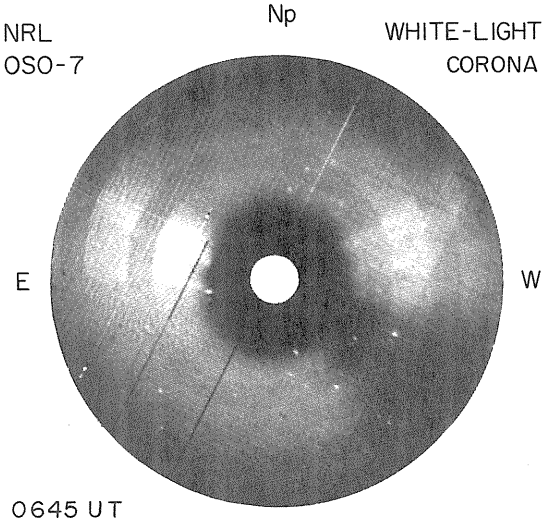
CANARY ISLAND



0830 UT

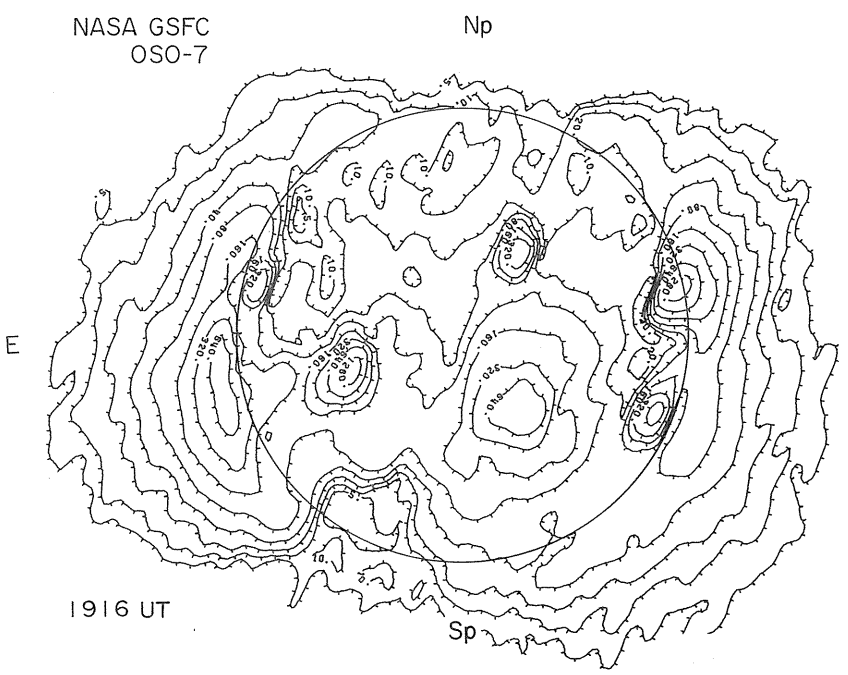
CORONA
NORIKURA

NRL
OSO-7



0645 UT

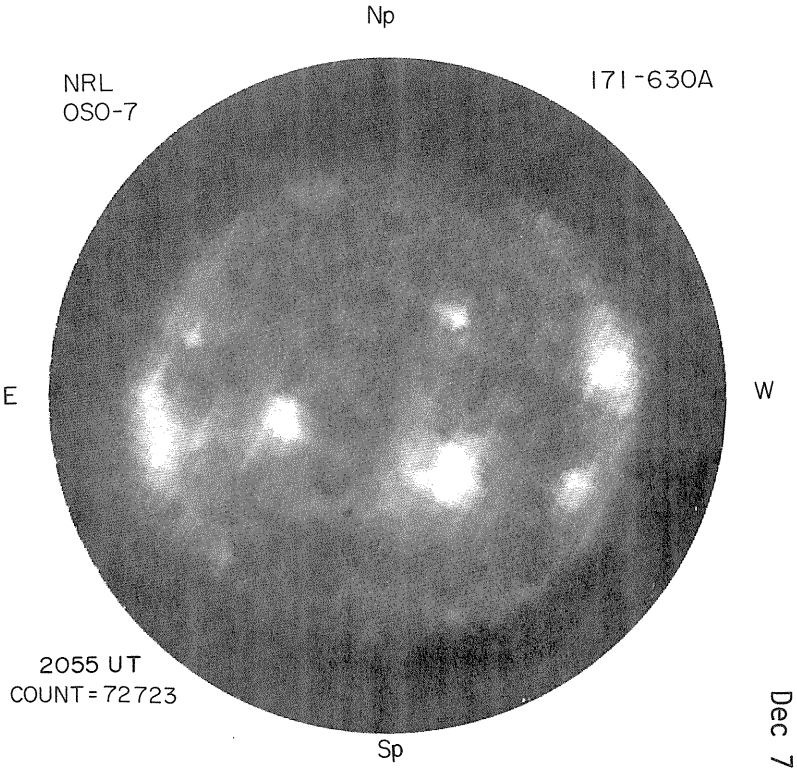
NASA GSFC
OSO-7



1916 UT

20 X 20 ARCSEC APERTURE
COUNT = 122350
ROLL = 106.9°
P-TH = 7.15

NRL
OSO-7



2055 UT
COUNT = 72723

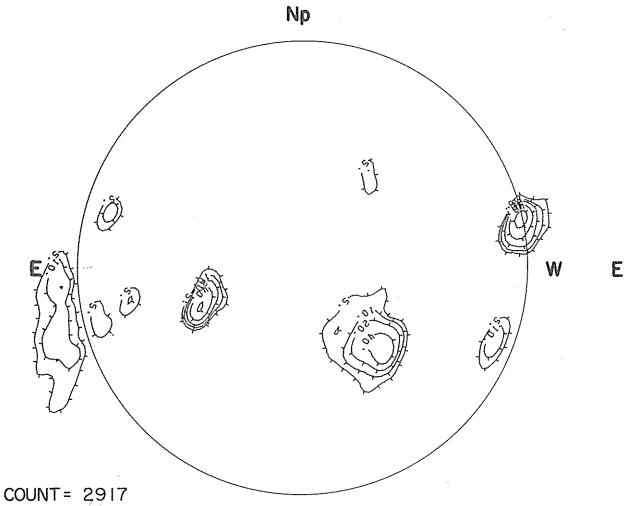
53
Dec 72

DECEMBER 17, 1972 (P = 9.24 B_o = -1.23 L_o = 38.90 MT. WILSON

54
Dec 72

NASA GSFC
OSO-7

X-RAY



COUNT = 2917
ROLL = 107.0°
P-TH = 7.14

0301 UT

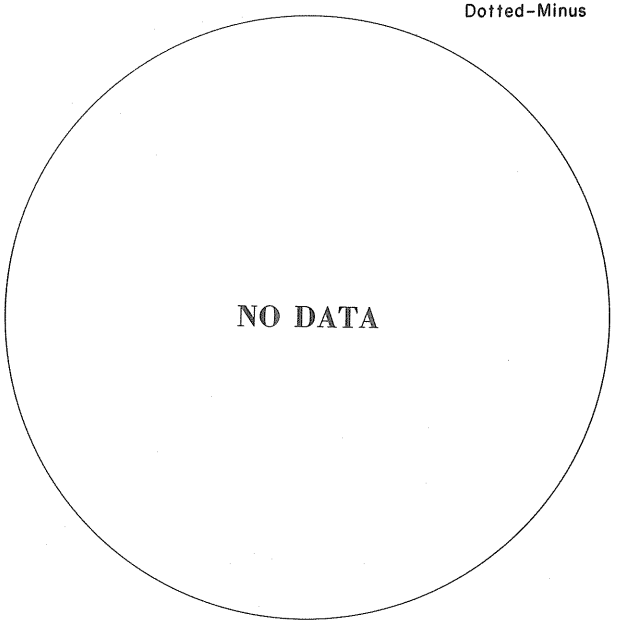
Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

Contours in Intervals of 200° K

MAGNETOGRAM
Solid-Plus
Dotted-Minus

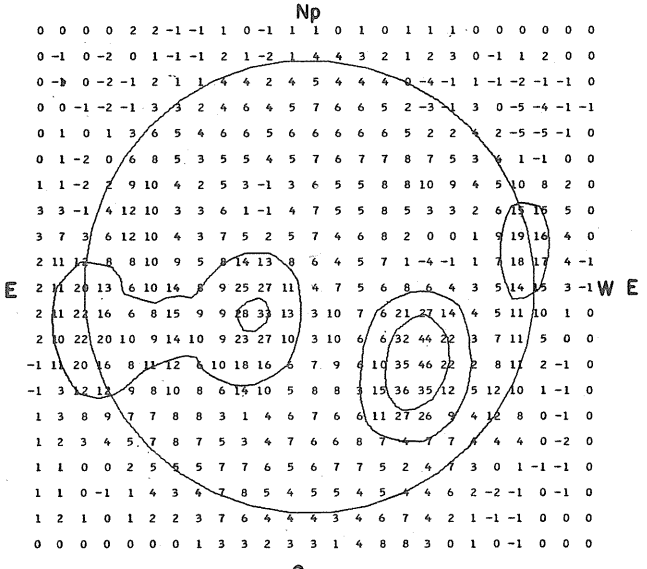


NO DATA

Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

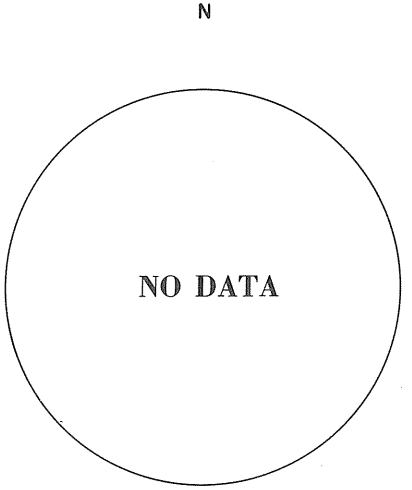


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm



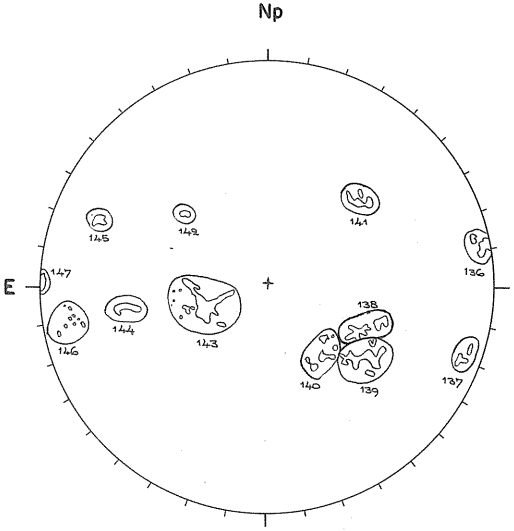
NO DATA

02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

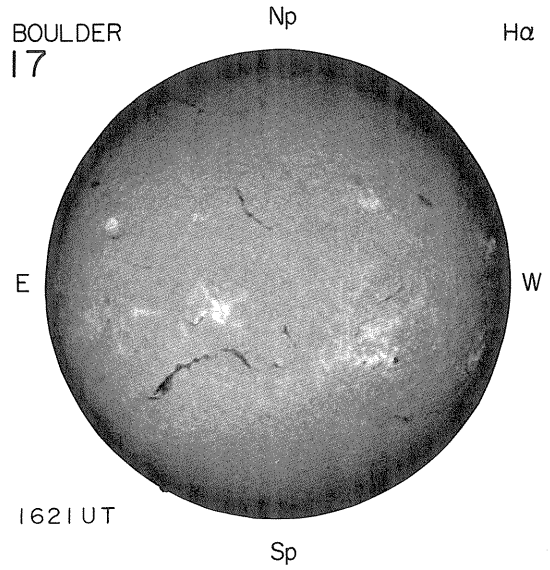
McMATH-HULBERT

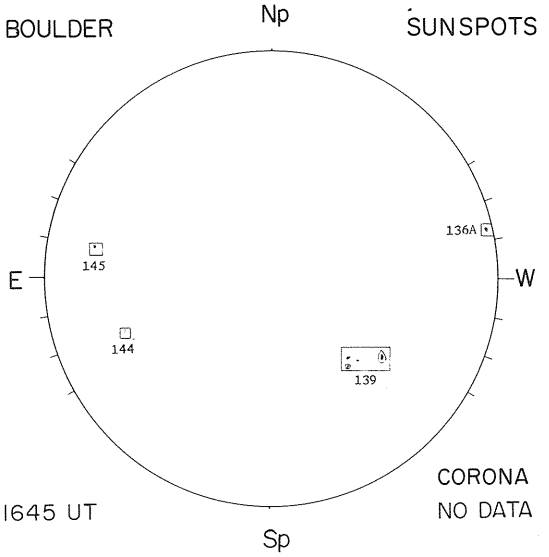
CALCIUM REPORT

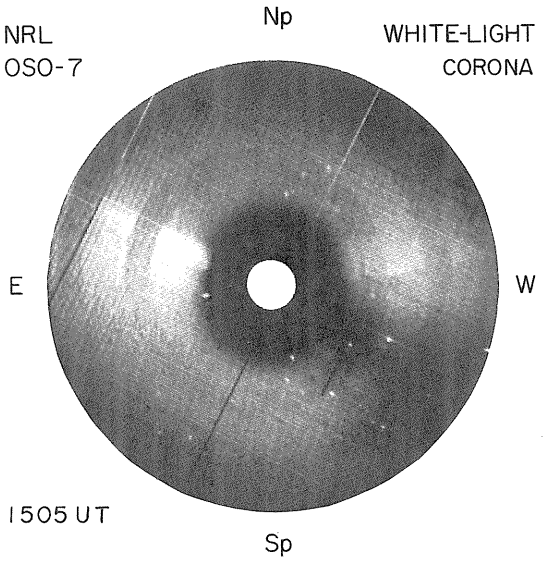


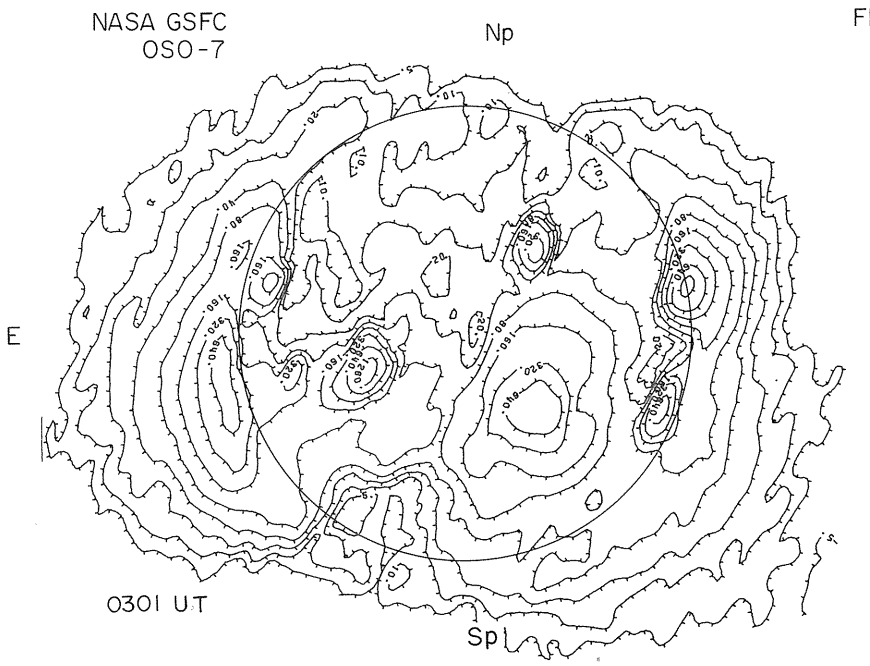
FAIR	M
36 - 2900	-3.0
37 - 1100	-2.5
38 - 1400	-2.5
39 - 1700	-3.0
41 - 0700	-2.5
43 - 2200	-3.5
44 - 0800	-3.0
45 - 0600	-3.0

1430 UT

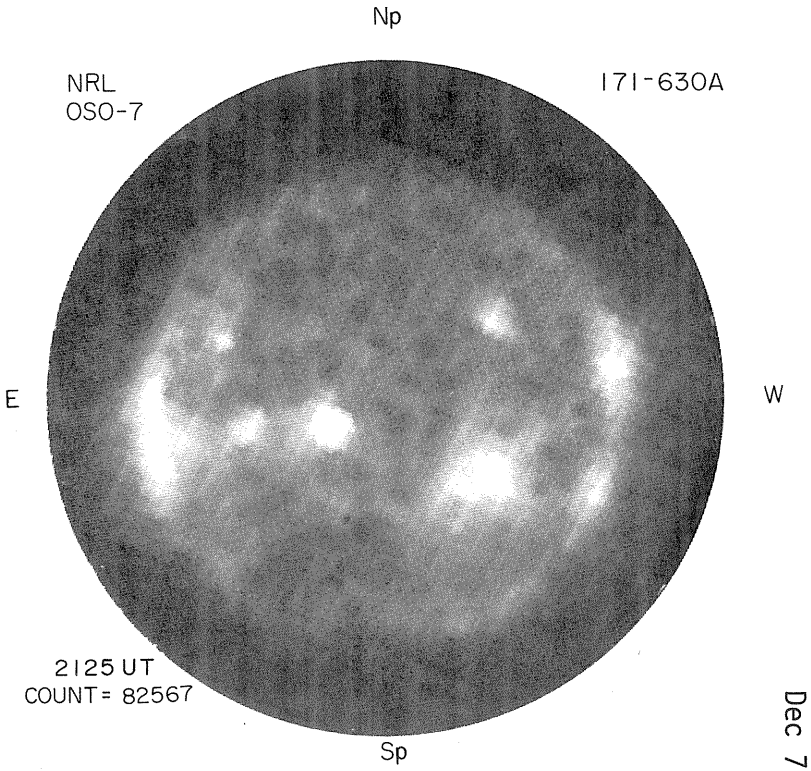








20 X 20 ARCSEC APERTURE
COUNT = 116002
ROLL = 107.0°
P-TH = 7.14



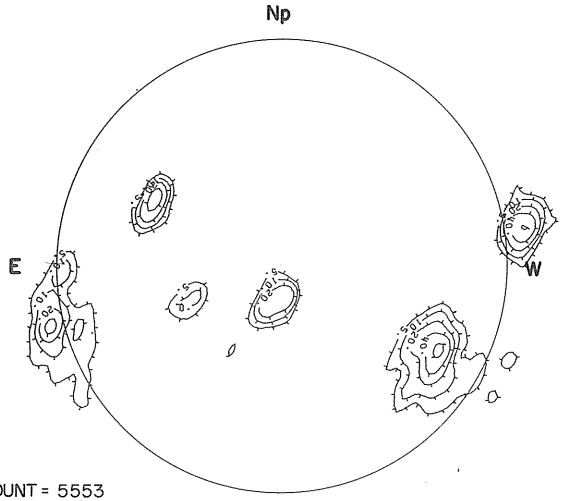
55
Dec 72

DECEMBER 18, 1972 (P = 8.78 B_o = -1.35 L_o = 25.73

56
Dec 72

NASA GSFC
OSO-7

X-RAY



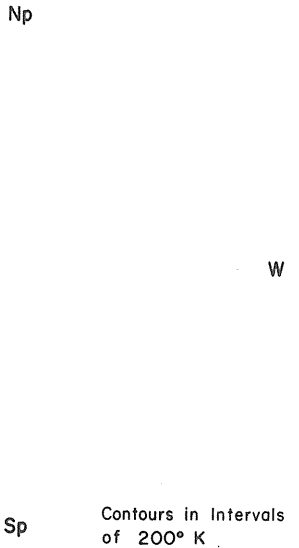
COUNT = 5553
ROLL = 107.5°
P-TH = 7.10

1748 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

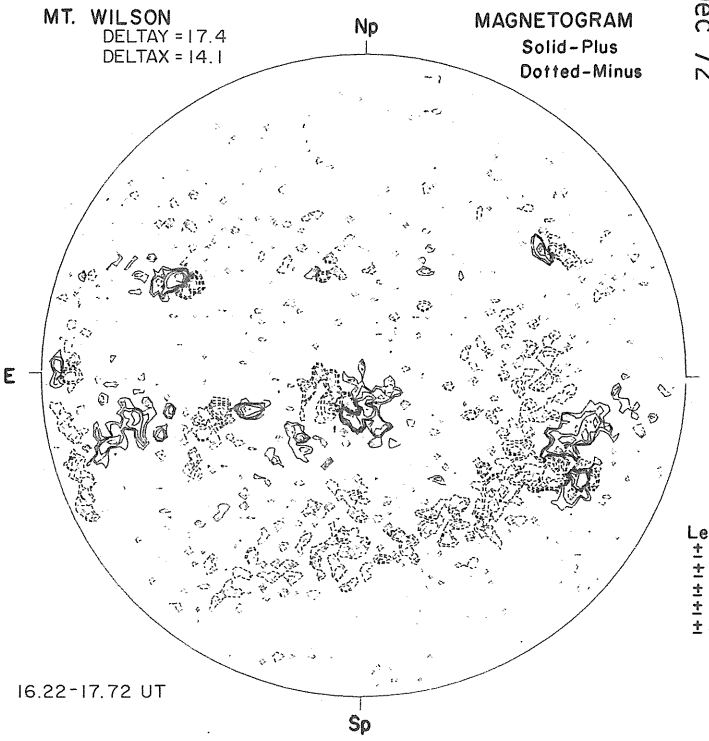
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.4
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

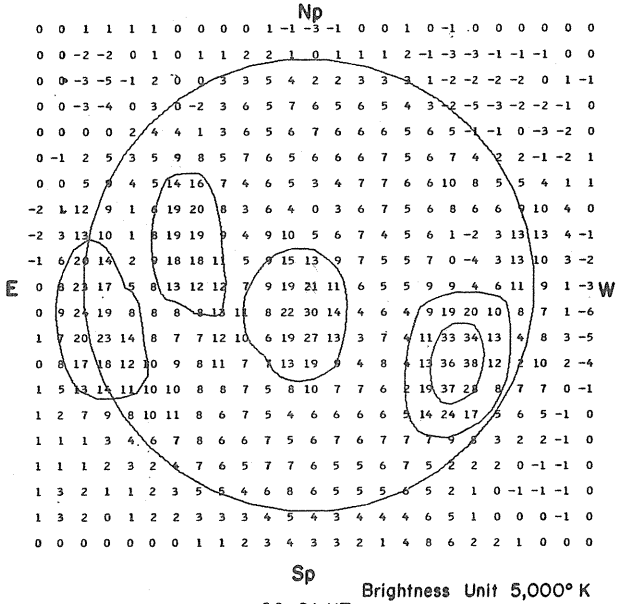


Levels
±5
±10
±20
±40
±80

16.22-17.72 UT

STANFORD

9.1 cm

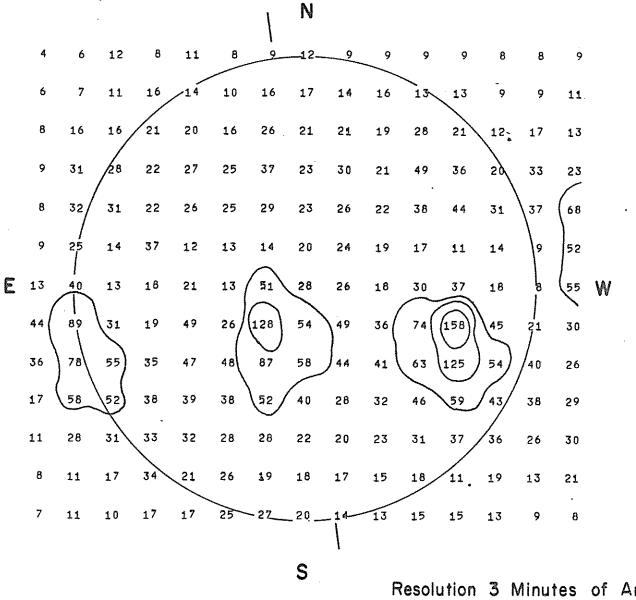


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

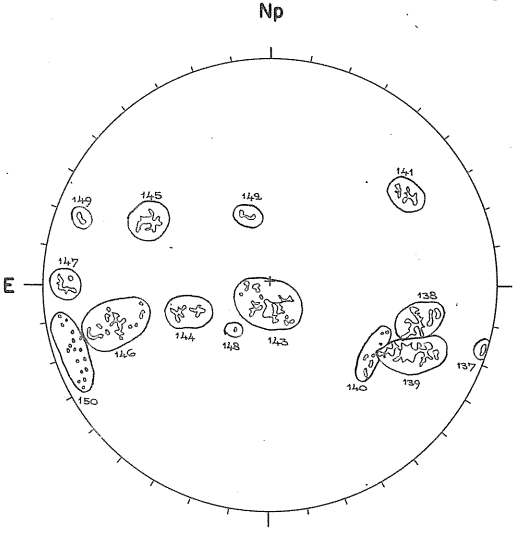


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

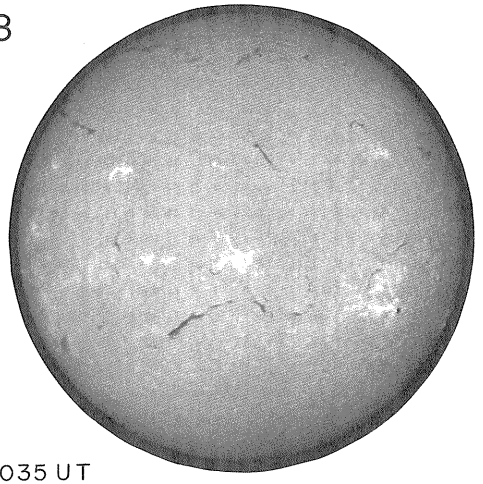
CALCIUM REPORT



GOOD	M
39 - 1500	-3.0
43 - 1800	-3.5
44 - 0500	-3.0
45 - 0800	-3.0

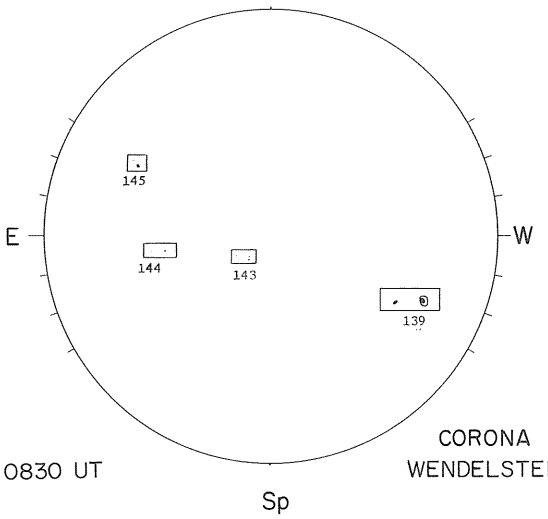
1950 UT

BOULDER
18



2035 UT

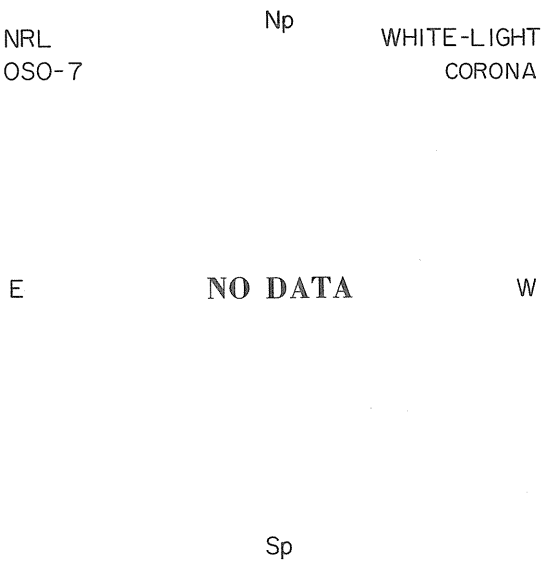
CANARY ISLAND



0830 UT

NRL
OSO-7

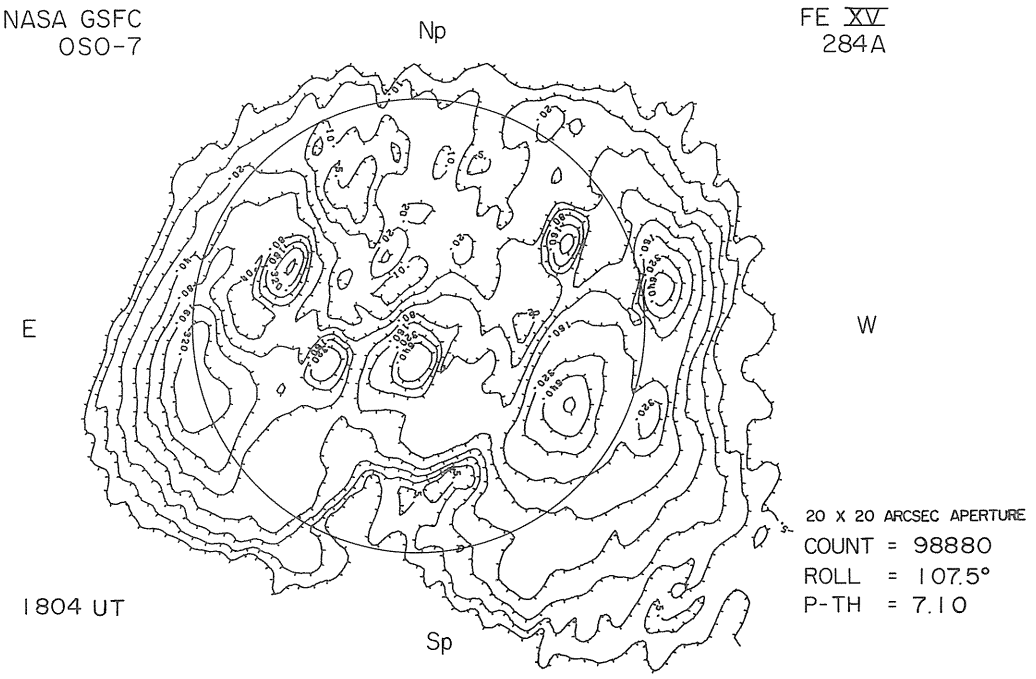
WHITE-LIGHT
CORONA



CORONA
WENDELSTEIN

NASA GSFC
OSO-7

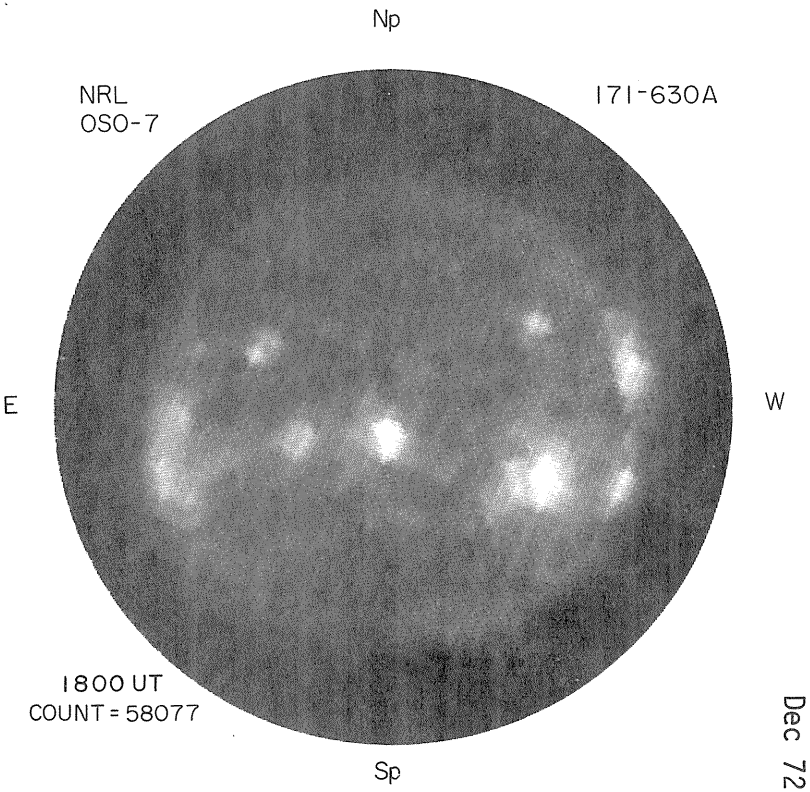
FE XV
284A



1804 UT

NRL
OSO-7

171-630A

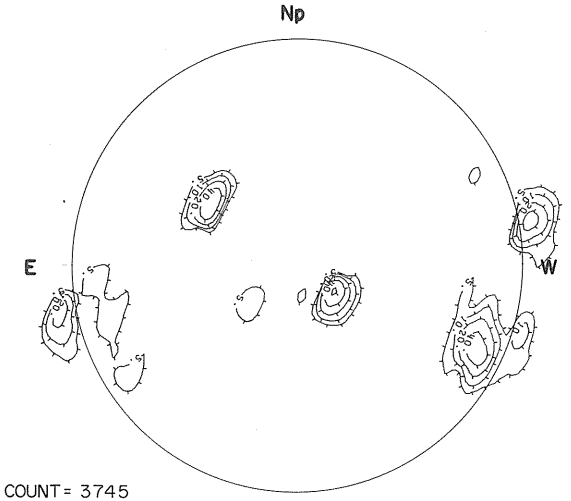


1800 UT
COUNT = 58077

DECEMBER 19, 1972 (P= 8.32 B_o = -1.48 L_o = 12.56

NASA GSFC
OSO-7

X-RAY



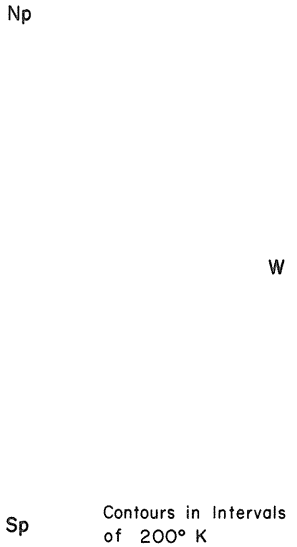
COUNT = 3745
ROLL = 107.0°
P-TH = 7.08

1644 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

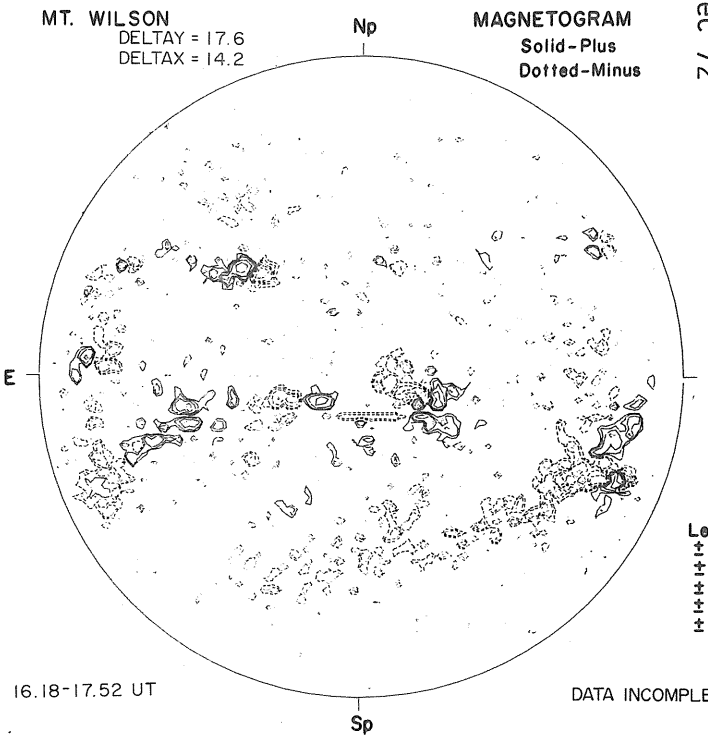
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.6
DELTAX = 14.2

MAGNETOGRAM
Solid-Plus
Dotted-Minus



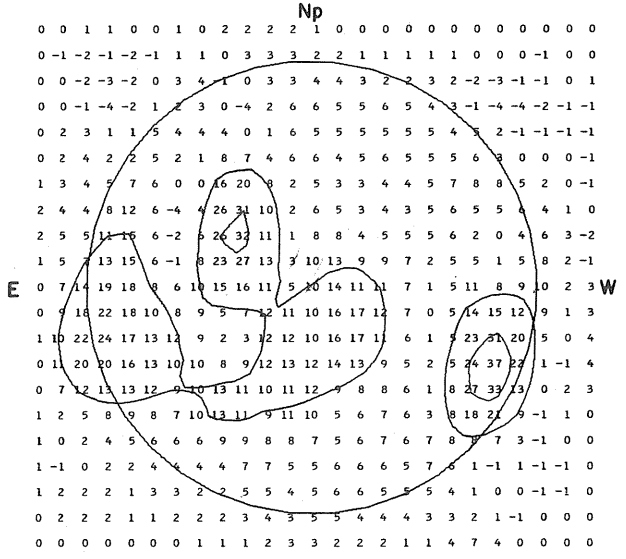
Levels
±5
±10
±20
±40
±80

16.18-17.52 UT

DATA INCOMPLETE

STANFORD

9.1 cm

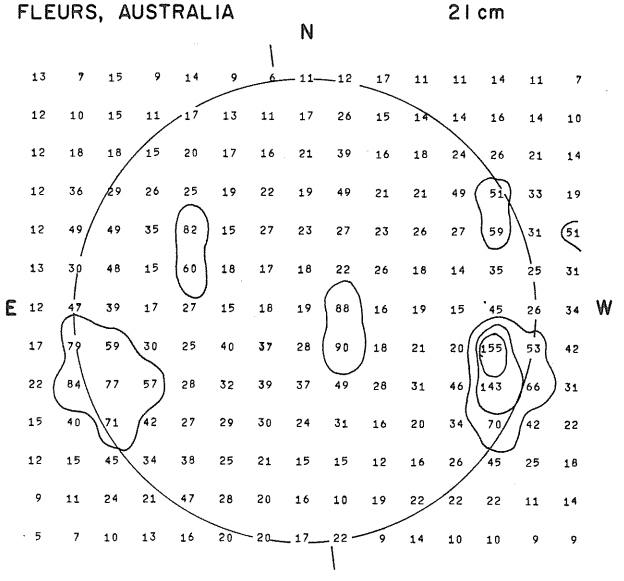


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

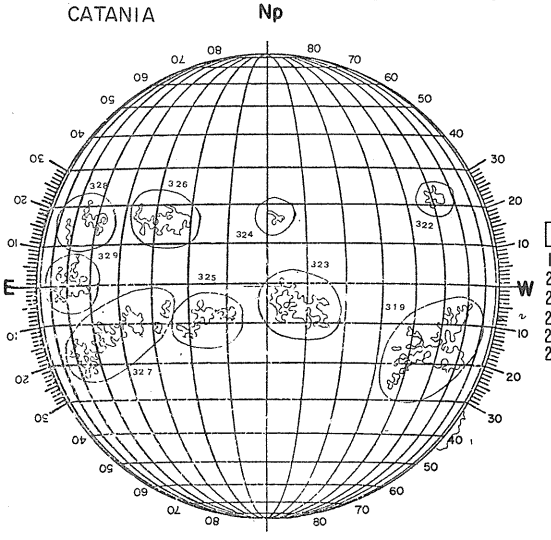


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CALCIUM REPORT

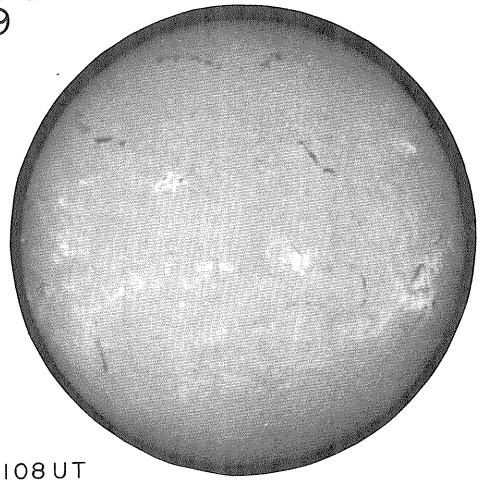
CATANIA



GOOD	GD
19 - 7367	---
22 - 0980	---
23 - 2423	---
25 - 1415	---
26 - 2234	---
27 - 4277	---

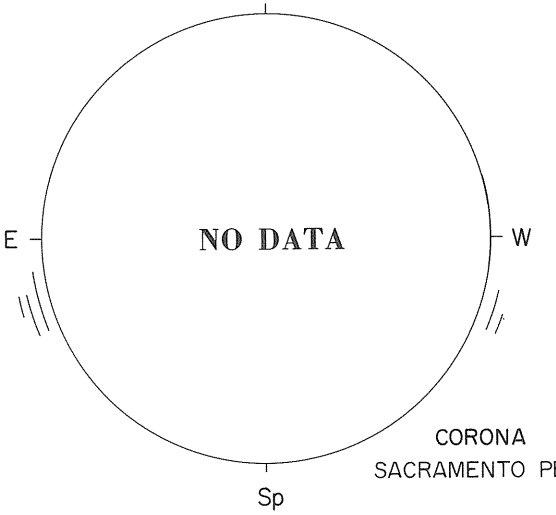
1100 UT

BOULDER
19



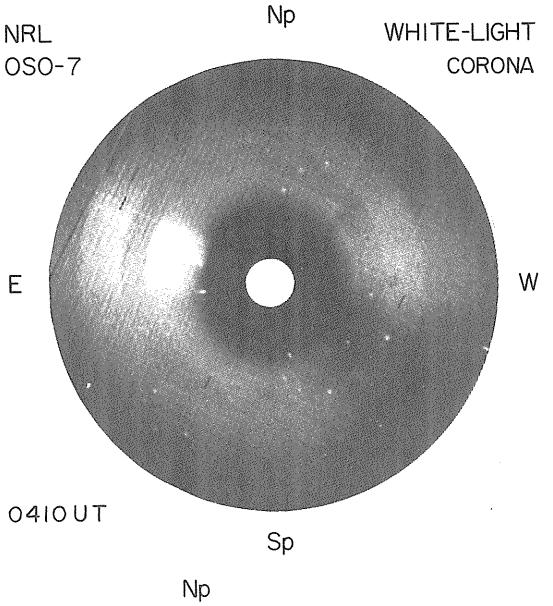
2108 UT

BOULDER

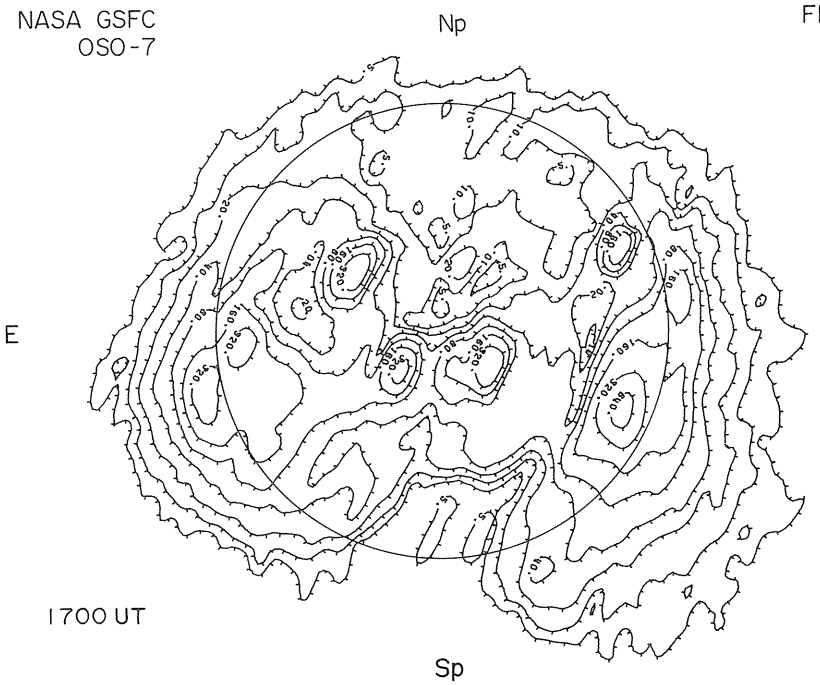


CORONA
SACRAMENTO PEAK 0410 UT

NRL
OSO-7



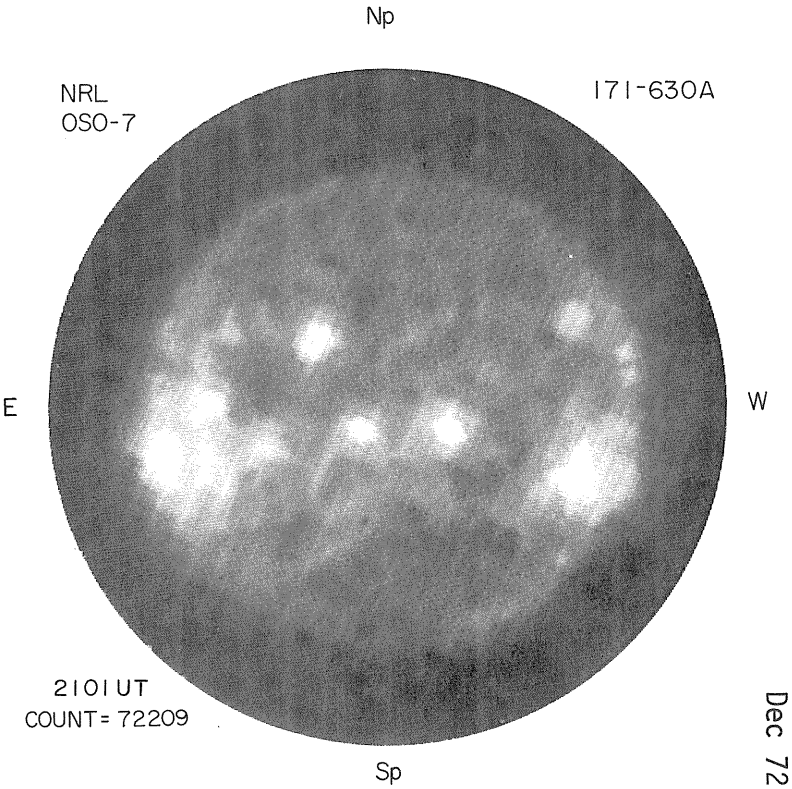
NASA GSFC
OSO-7



1700 UT

COUNT = 68490
ROLL = 107.0°
P-TH = 7.08

NRL
OSO-7

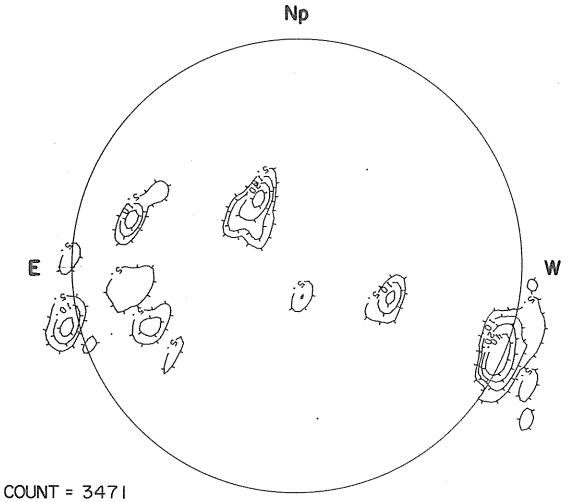


2101 UT
COUNT = 72209

DECEMBER 20, 1972 (P = 7.85 B_o = -1.60 L_o = 359.38

NASA GSFC
OSO-7

X-RAY



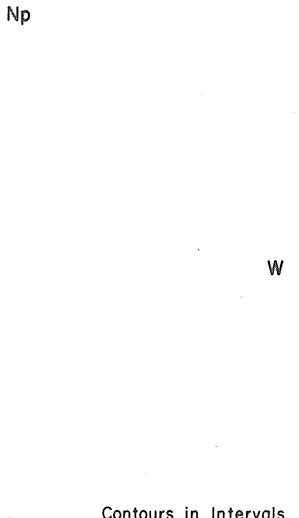
COUNT = 3471
ROLL = 107.3°
P-TH = 7.05

1430 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

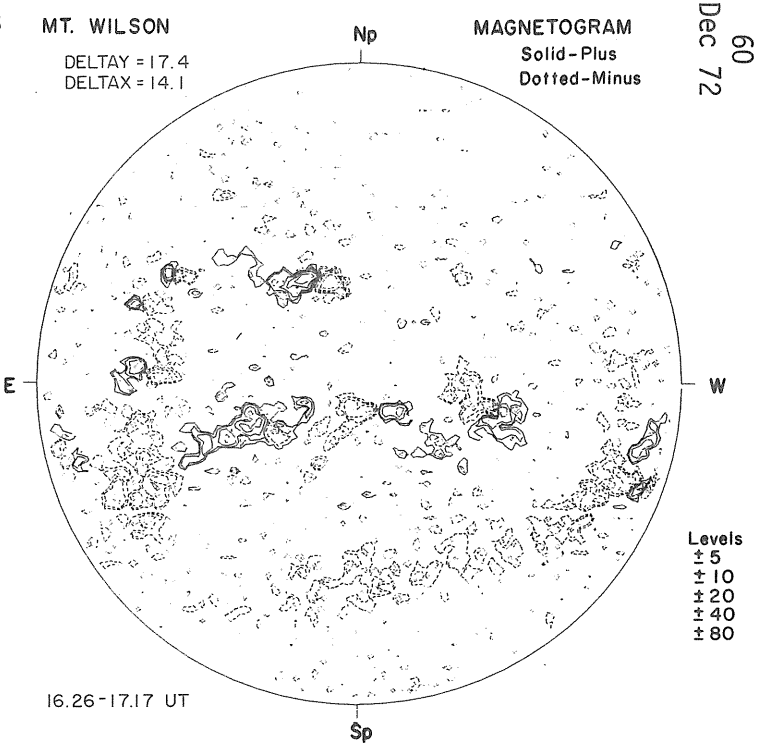


Contours in Intervals of 200° K

MT. WILSON

DELTAY = 17.4
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

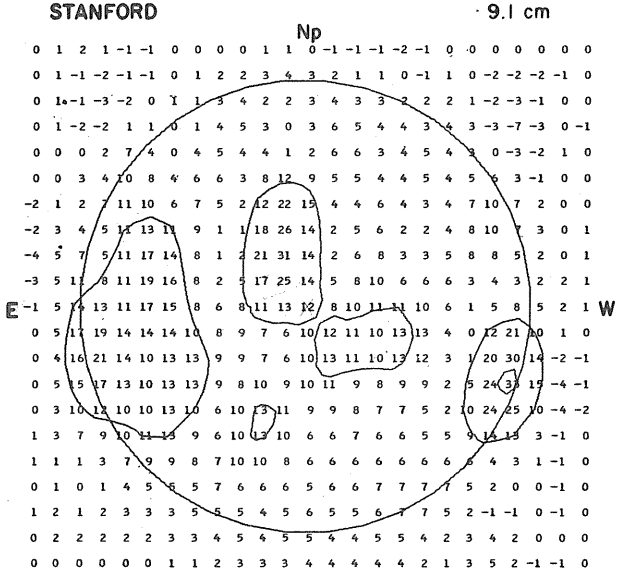


Levels
±5
±10
±20
±40
±80

16.26-17.17 UT

STANFORD

9.1 cm

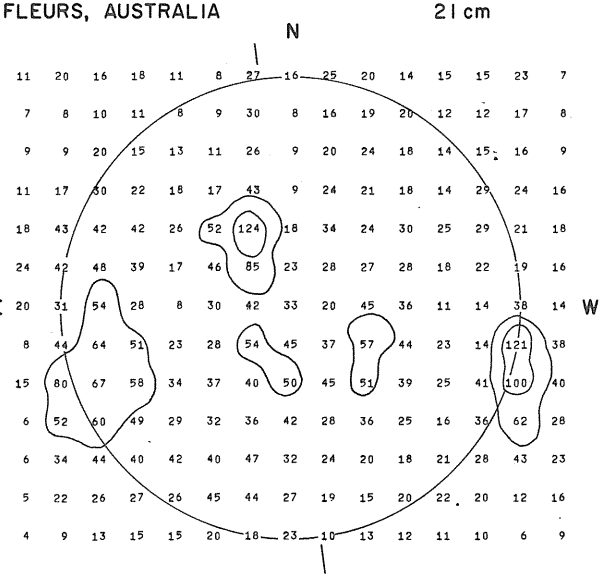


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

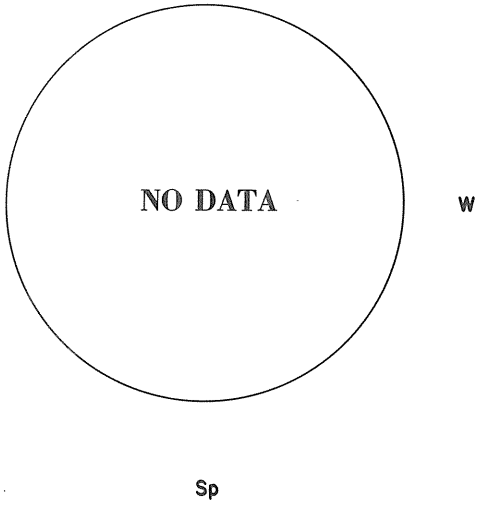


02-03 UT

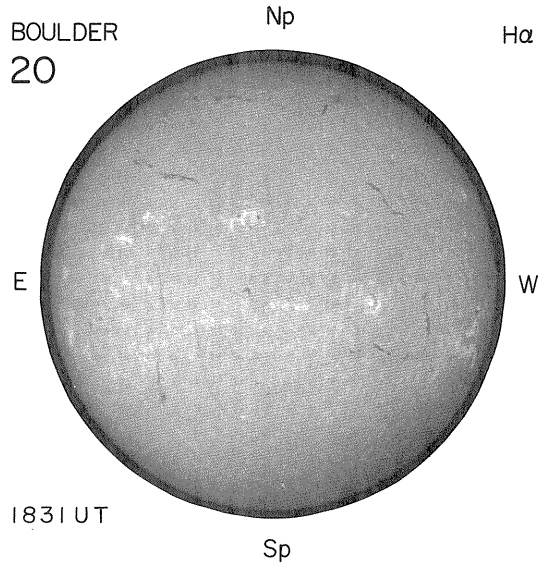
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

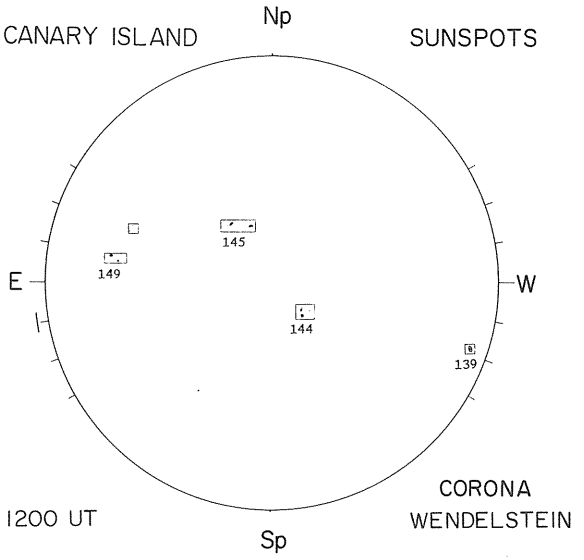
McMATH-HULBERT

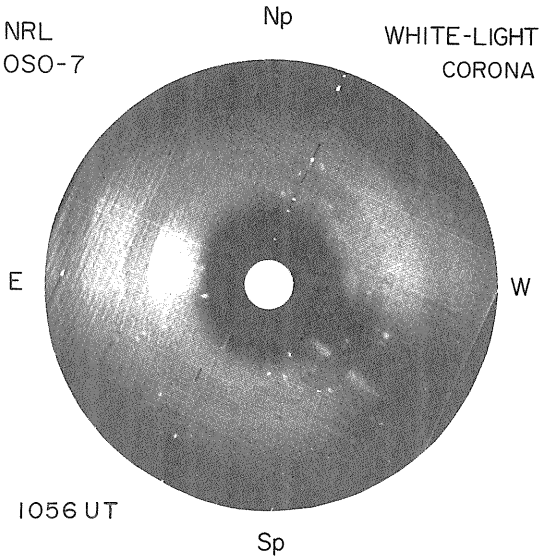
CALCIUM REPORT

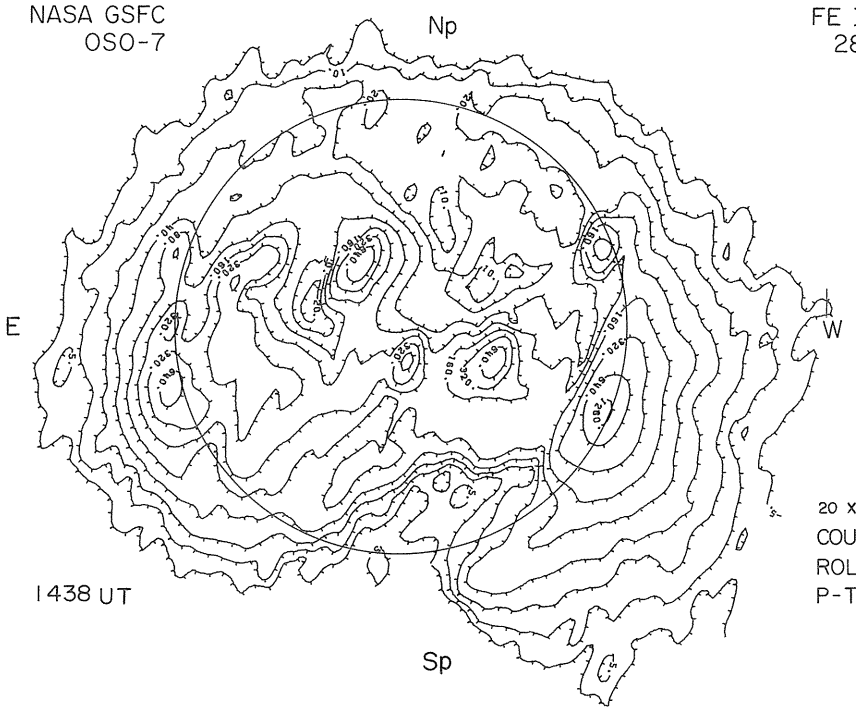


NO DATA

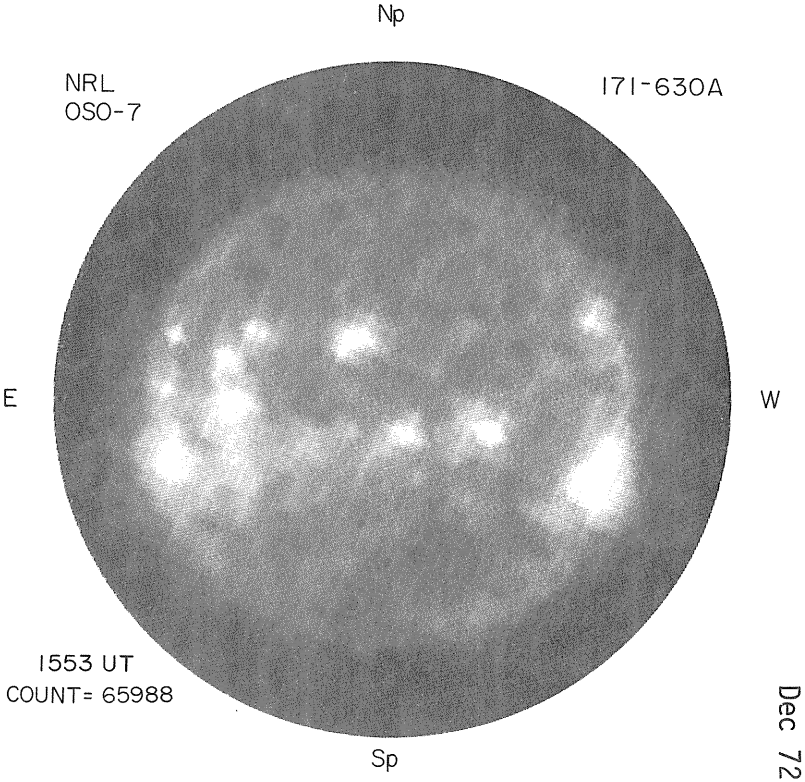








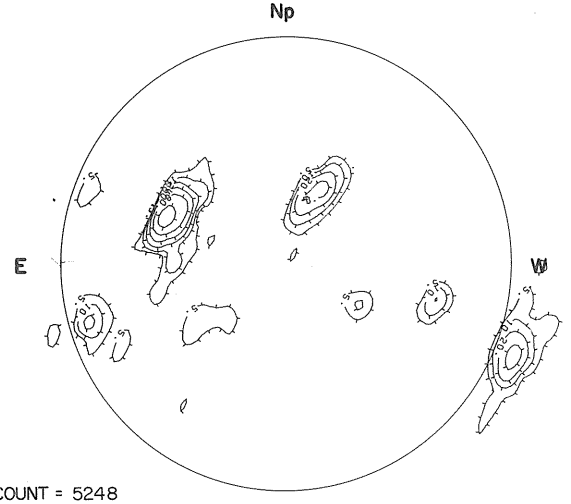
20 X 20 ARCSEC APERTURE
COUNT = 124453
ROLL = 107.3°
P-TH = 7.05



DECEMBER 21, 1972 (P= 7.38 B_o = -1.73 L_o = 346.21

NASA GSFC
OSO-7

X-RAY



COUNT = 5248
ROLL = 106.6°
P-TH = 7.02

1629 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

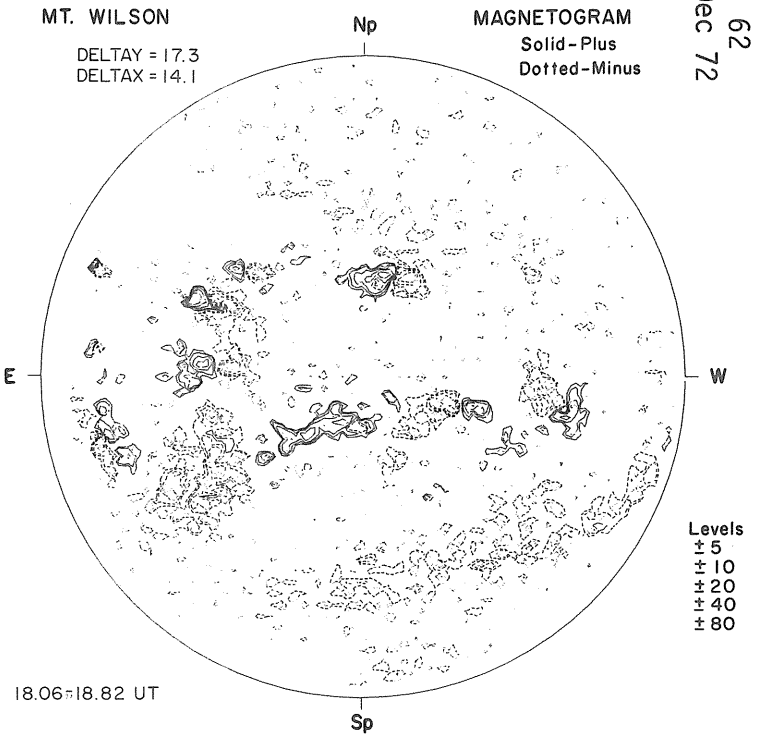
Np
E
W
Sp

Contours in Intervals of 200° K

MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTAY = 17.3
DELTAX = 14.1

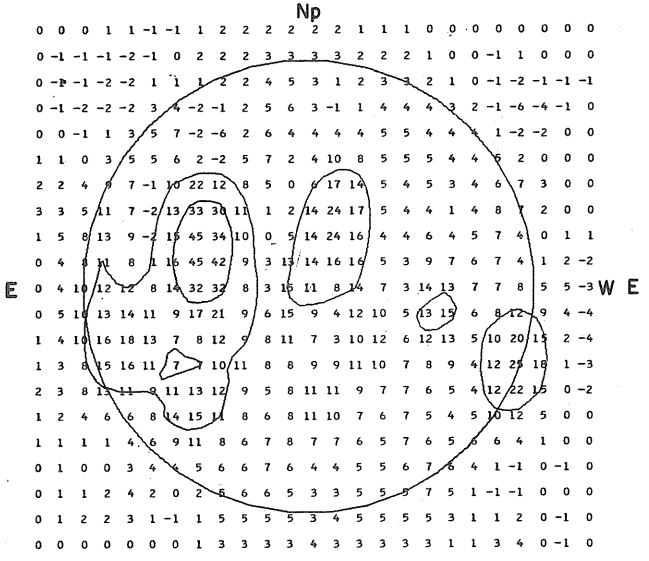


Levels
±5
±10
±20
±40
±80

18.06-18.82 UT

STANFORD

9.1 cm

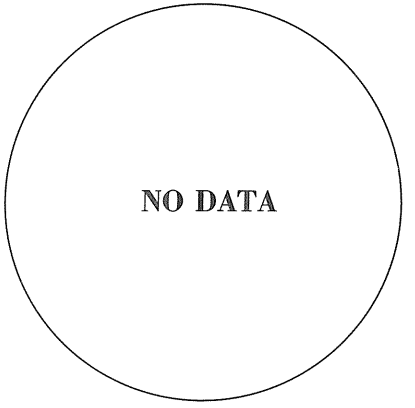


Brightness Unit 5,000° K

20-21 UT

FLEURS, AUSTRALIA

21 cm

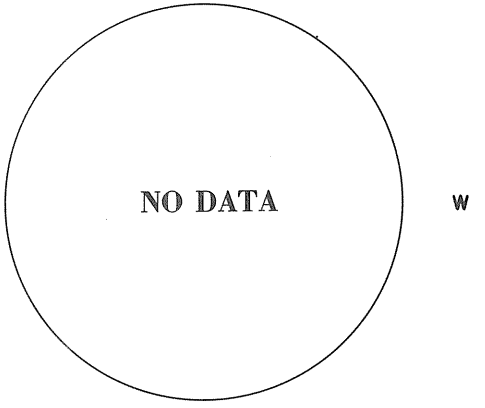


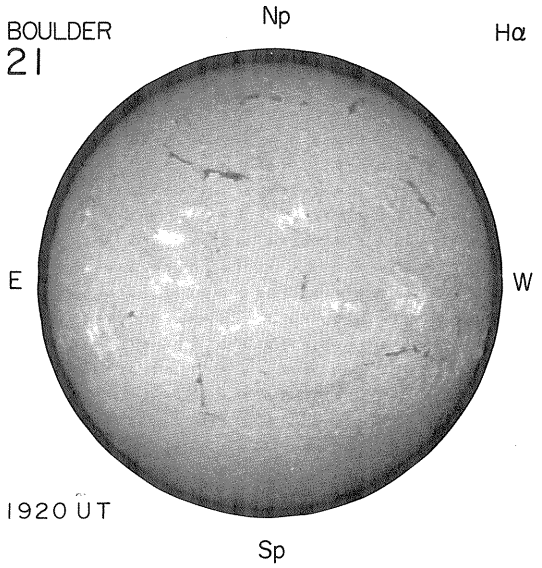
02-03 UT

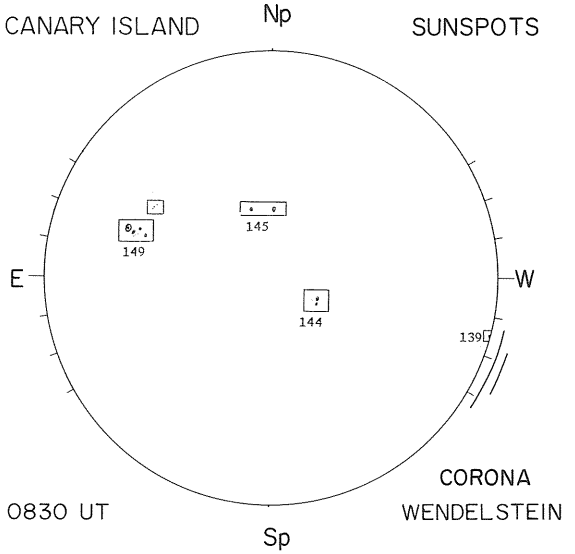
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

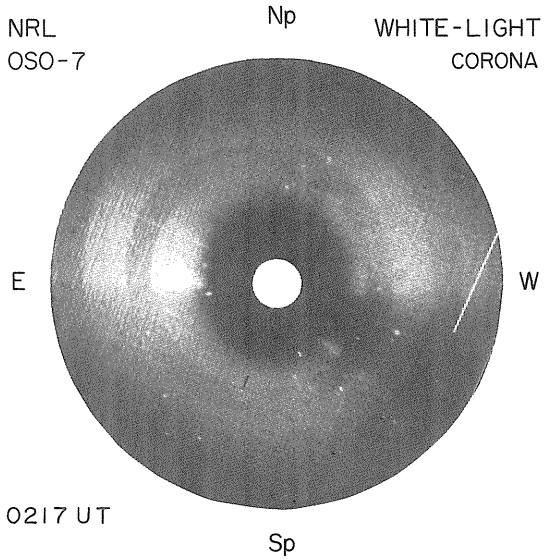
McMATH-HULBERT

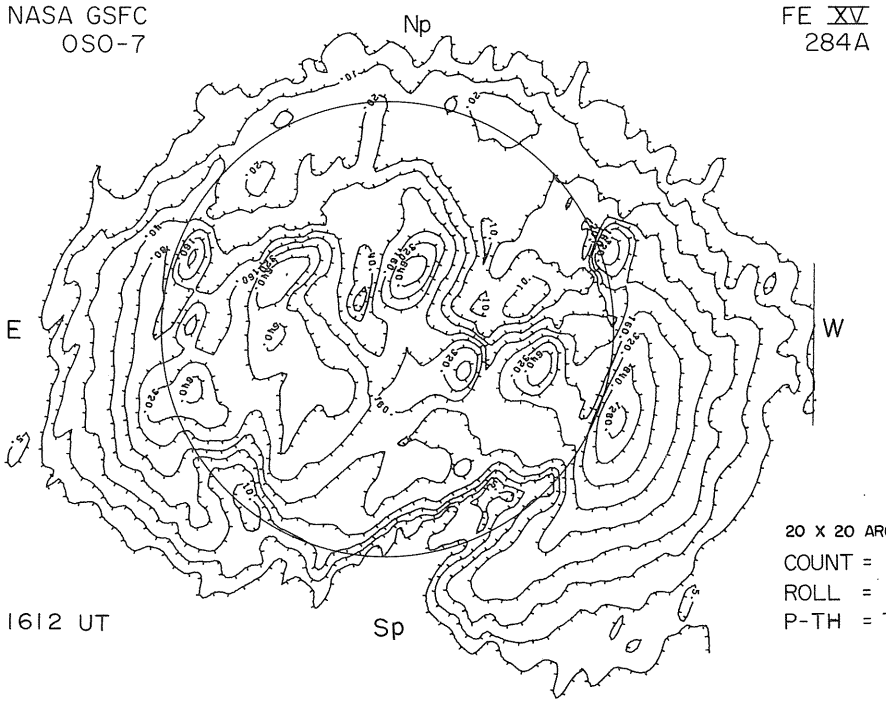
CALCIUM REPORT

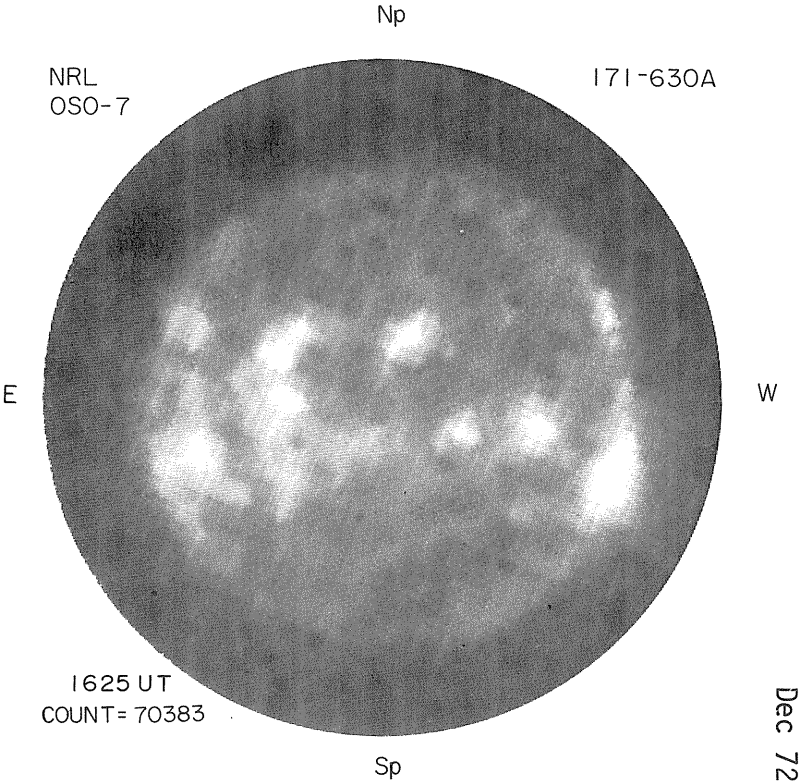



BOULDER
21
Np
Hα
E
W
1920 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
149
145
144
139
E
W
CORONA
WENDELSTEIN
0830 UT
Sp


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
0217 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
1612 UT
Sp
20 X 20 ARCSEC APERTURE
COUNT = 135733
ROLL = 106.6°
P-TH = 7.02

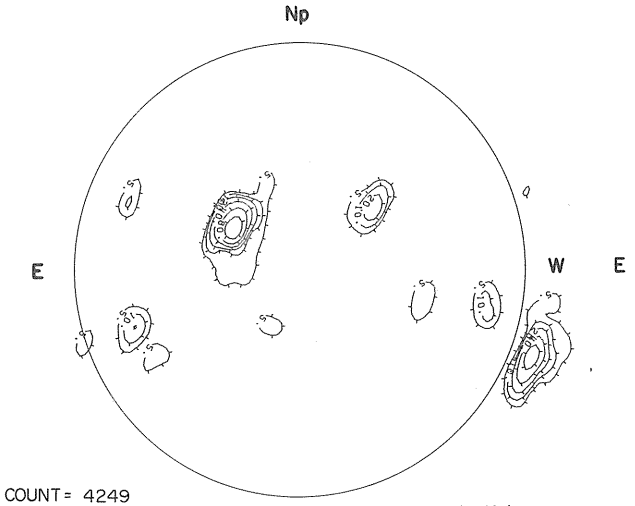

Np
NRL
OSO-7
171-630A
E
W
1625 UT
COUNT= 70383
Sp

63
Dec 72

DECEMBER 22, 1972 (P = 6.90 B_o = -1.85 L_o = 333.04

NASA GSFC
OSO-7

X-RAY



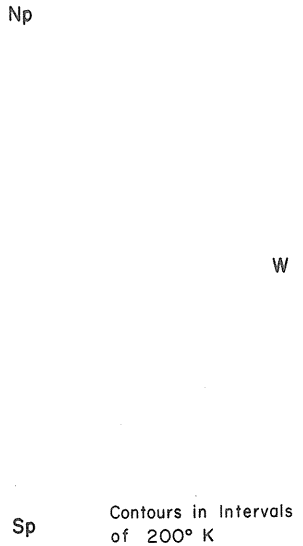
COUNT = 4249
ROLL = 106.3°
P-TH = 6.99

1409 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

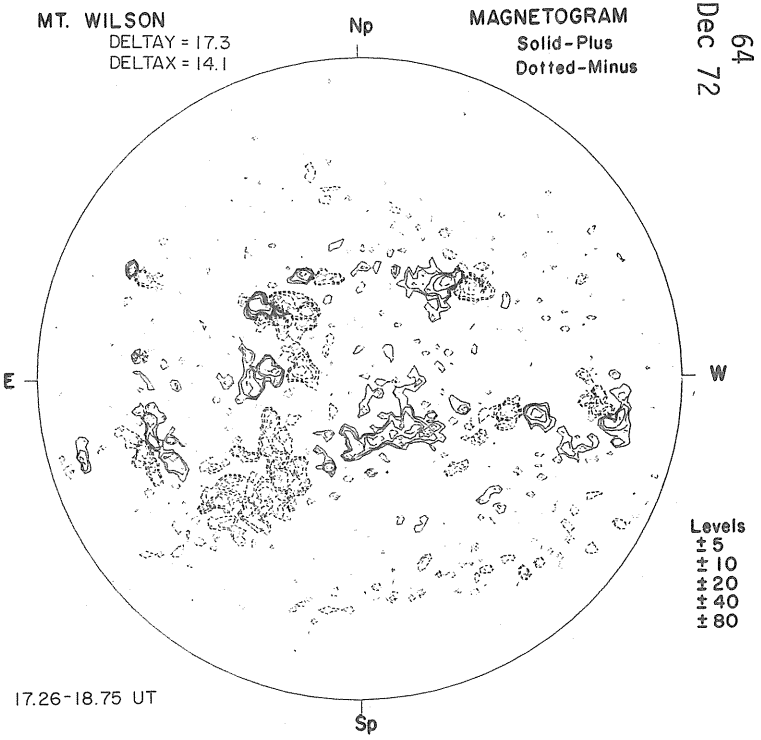
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.3
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

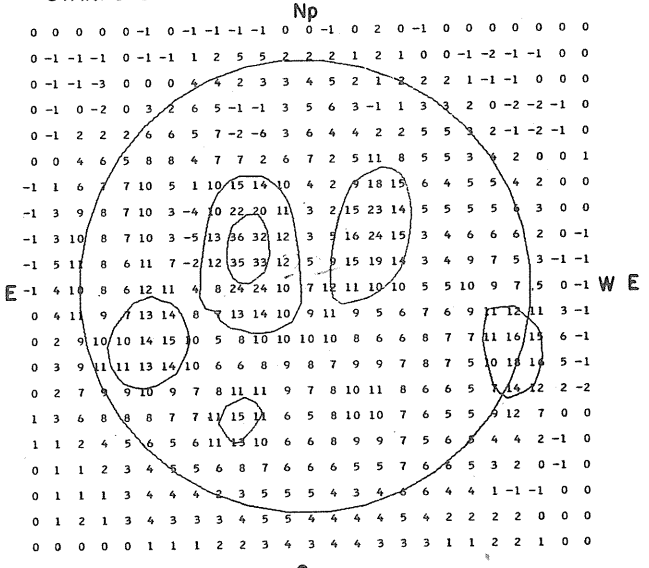


Levels
±5
±10
±20
±40
±80

17.26-18.75 UT

STANFORD

9.1 cm

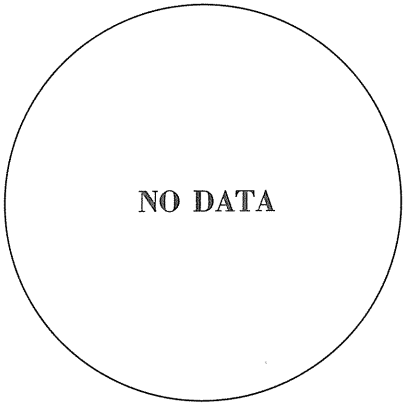


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

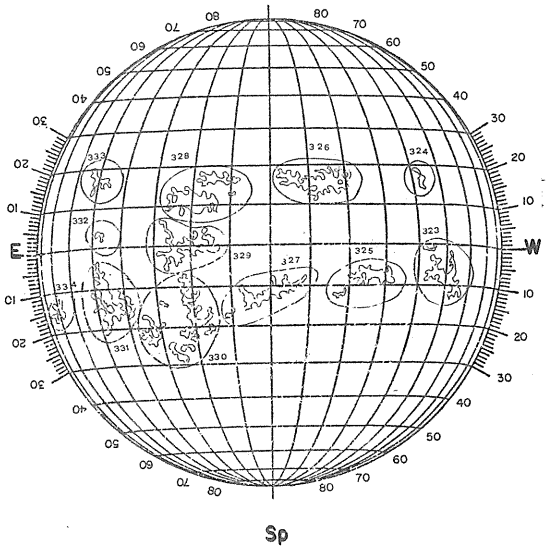


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

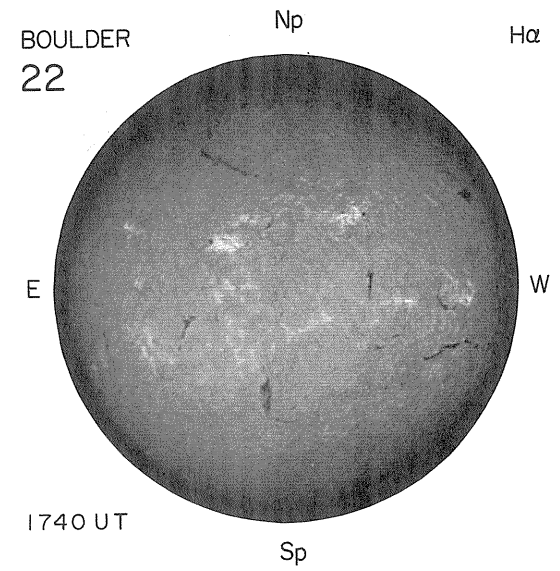
CALCIUM REPORT

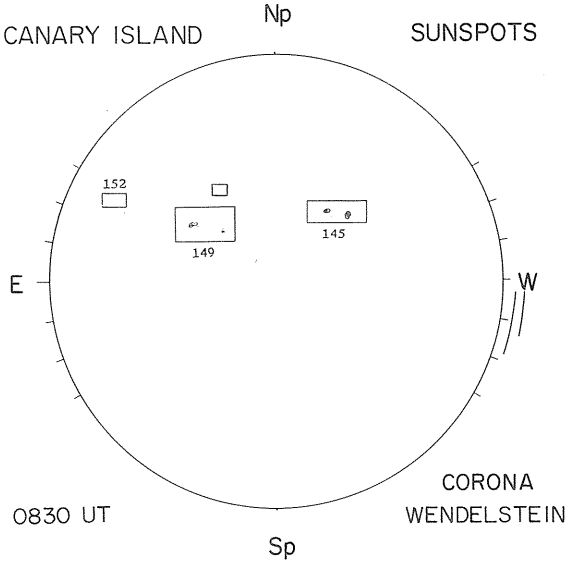
CATANIA

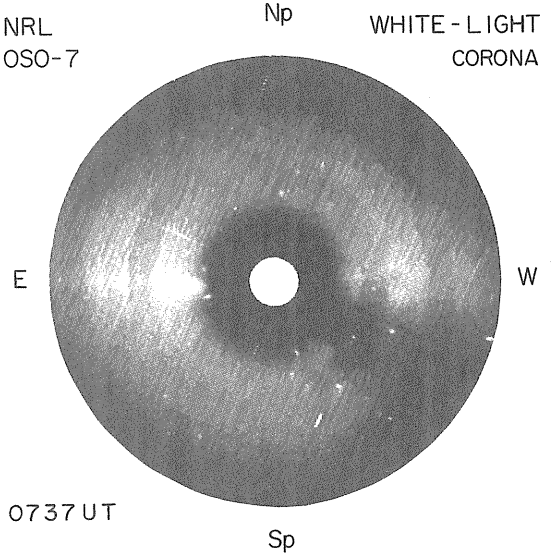


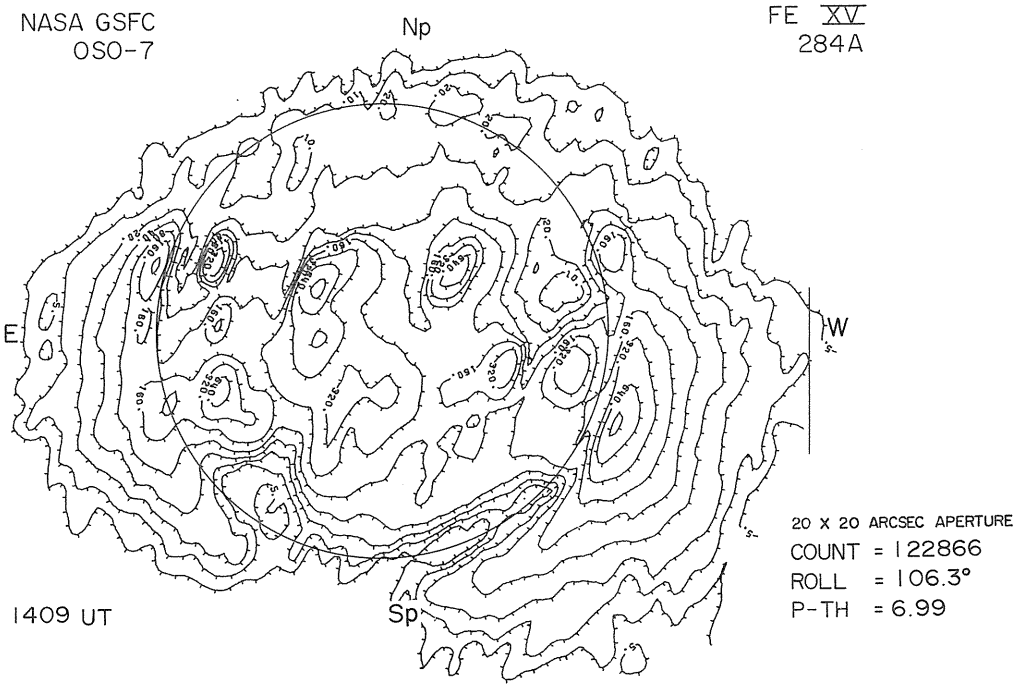
FAIR	GD
23 - 2555	---
25 - 1350	---
26 - 2676	---
27 - 1749	---
28 - 2800	---

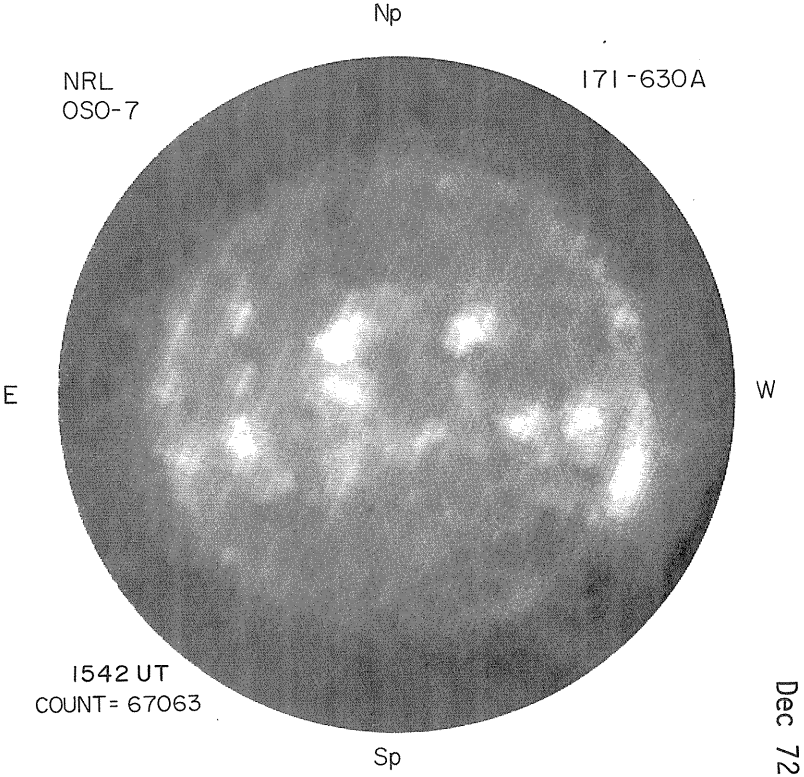
0920 UT


BOULDER
22
Np
Hα
E
W
1740 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
152
149
145
E
W
0830 UT
Sp
CORONA
WENDELSTEIN


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
0737 UT
Sp

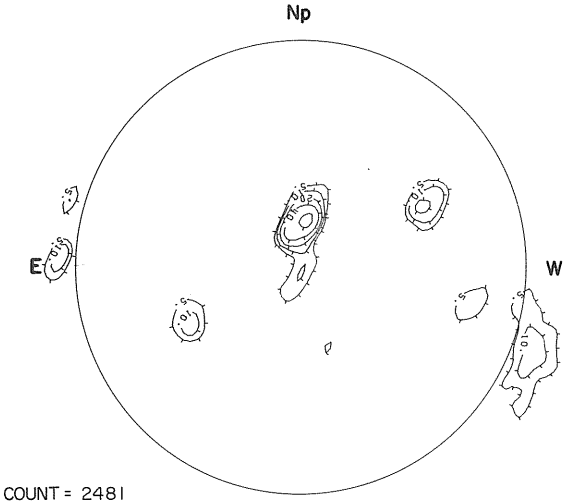

NASA GSFC
OSO-7
Np
FE XV
284A
E
W
Sp
1409 UT
20 X 20 ARCSEC APERTURE
COUNT = 122866
ROLL = 106.3°
P-TH = 6.99


Np
NRL
OSO-7
171-630A
E
W
1542 UT
COUNT = 67063
Sp

DECEMBER 23, 1972 (P = 6.43 B_o = -1.98 L_o = 319.86

NASA GSFC
OSO-7

X-RAY



COUNT = 2481
ROLL = 105.9°
P-TH = 6.95

2209 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

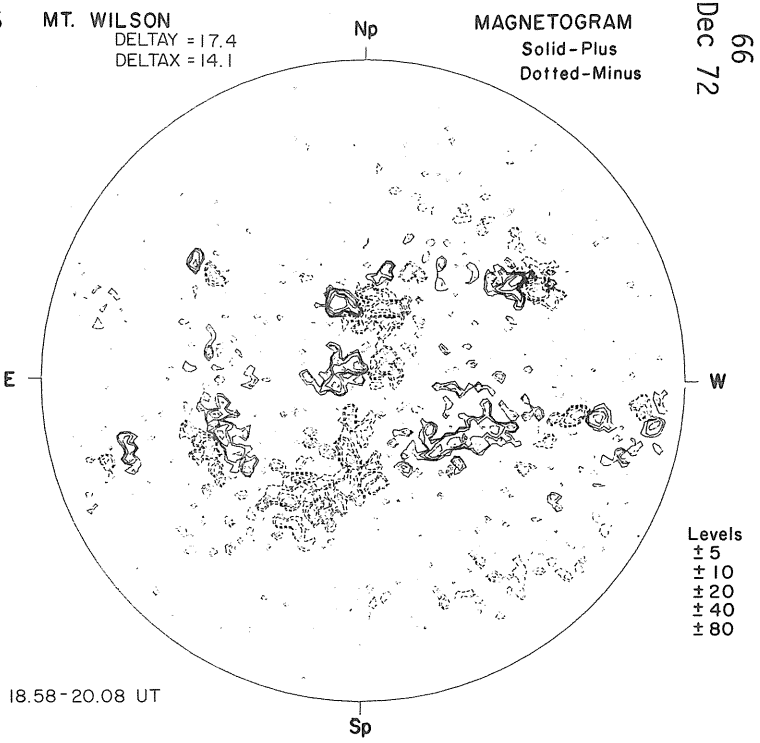
PROSPECT HILL
AFCRL

8.6 mm

Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.4
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

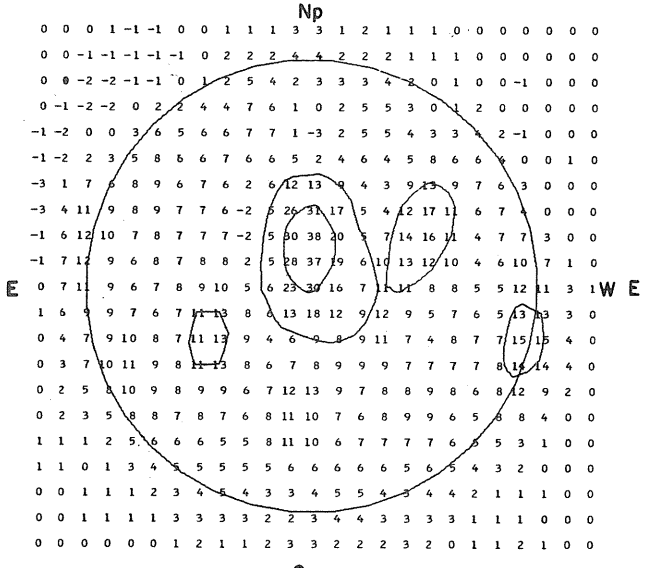


Levels
±5
±10
±20
±40
±80

18.58-20.08 UT

STANFORD

9.1 cm

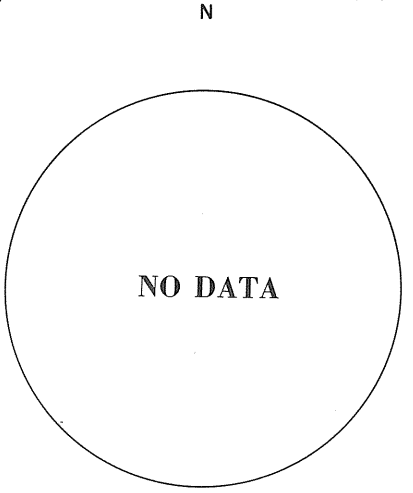


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

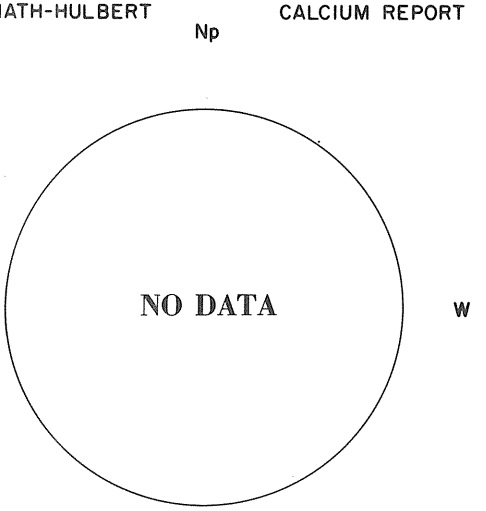
21 cm



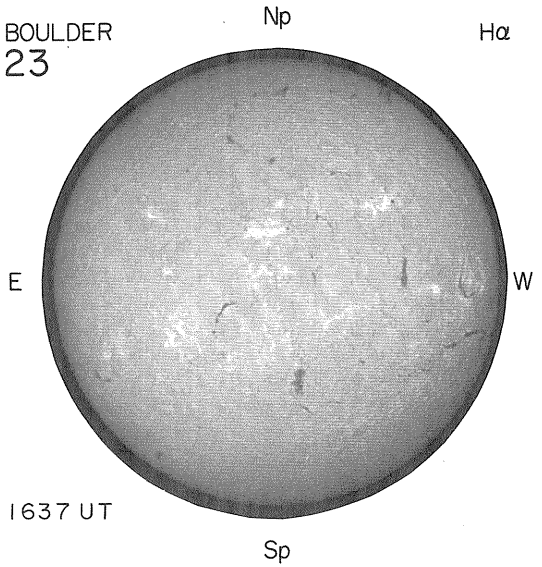
02-03 UT

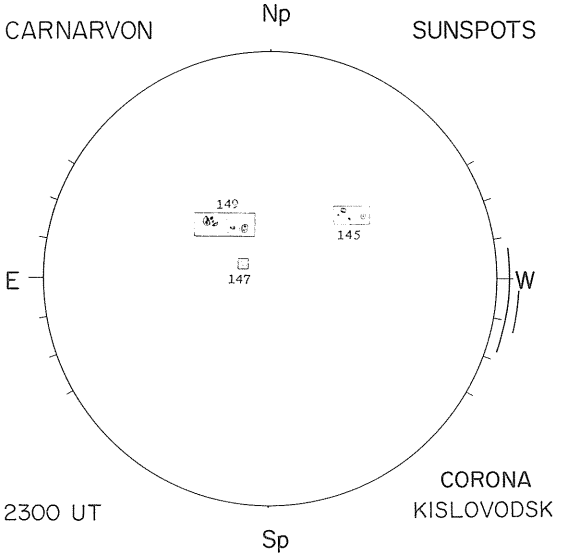
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

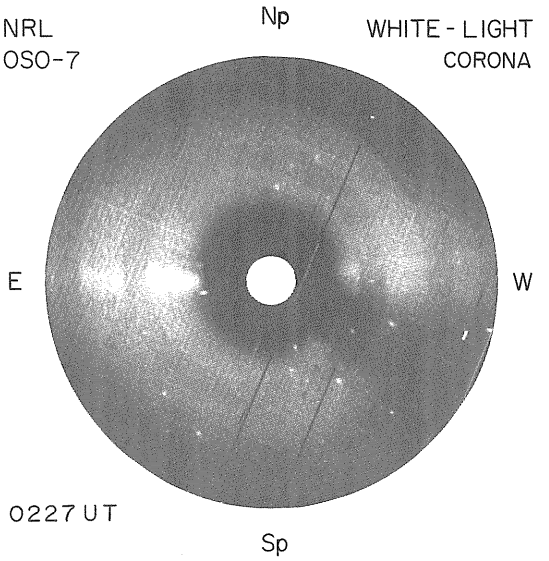
McMATH-HULBERT

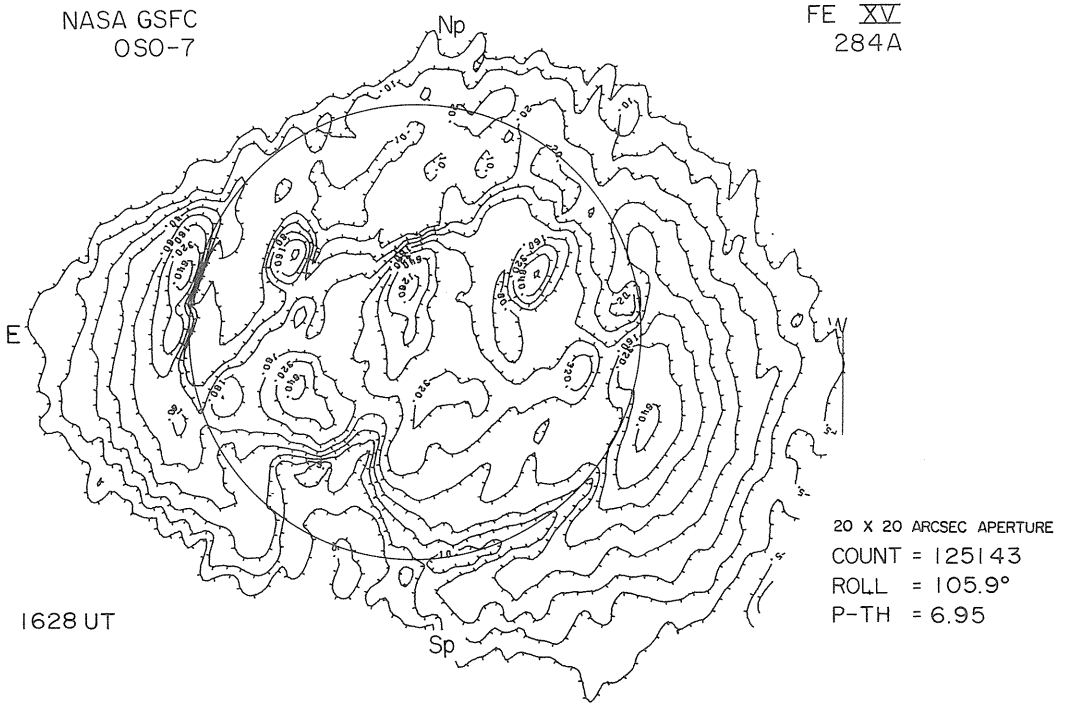


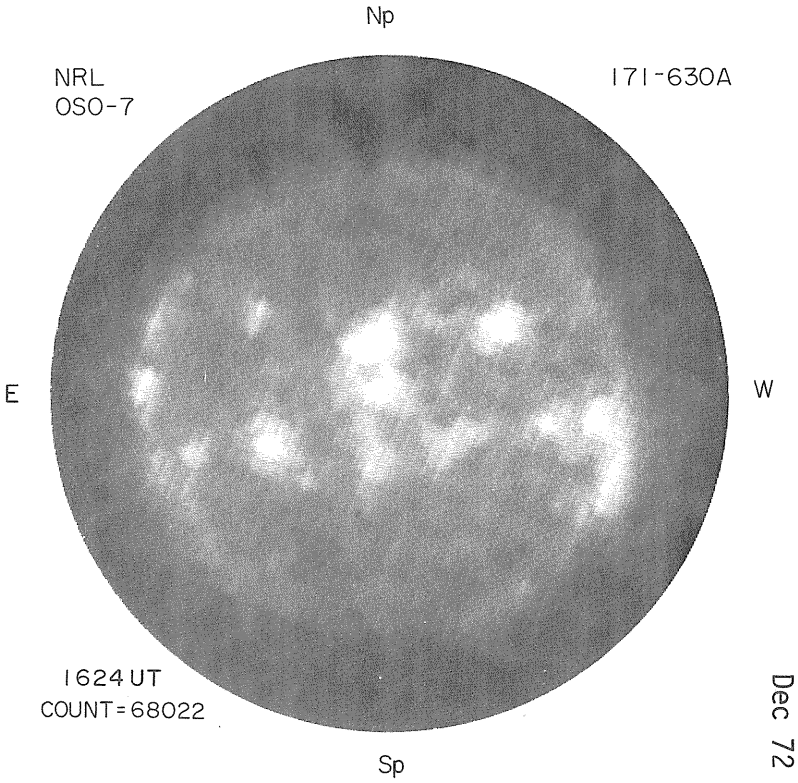
CALCIUM REPORT


BOULDER
23
Np
Hα
E
W
1637 UT
Sp


CARNARVON
Np
SUNSPOTS
140
145
147
E
W
2300 UT
Sp
CORONA
KISLOVODSK


NRL
OSO-7
Np
WHITE - LIGHT
CORONA
E
W
0227 UT
Sp

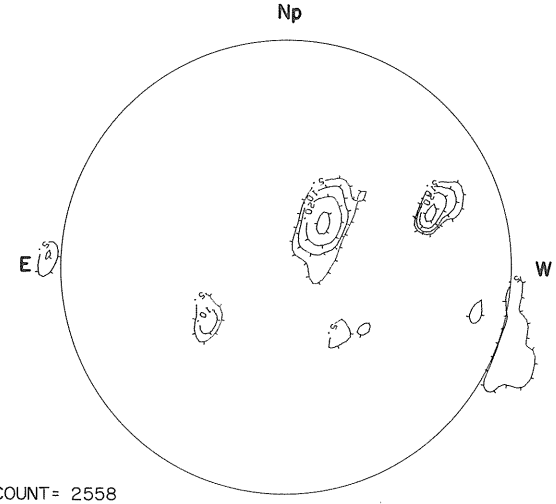

NASA GSFC
OSO-7
Np
FE XV
284A
E
W
1628 UT
Sp
20 X 20 ARCSEC APERTURE
COUNT = 125143
ROLL = 105.9°
P-TH = 6.95


Np
NRL
OSO-7
171-630A
E
W
1624 UT
COUNT = 68022
Sp

DECEMBER 24, 1972 (P = 5.95 B_o = -2.10 L_o = 306.69

NASA GSFC
OSO-7

X-RAY



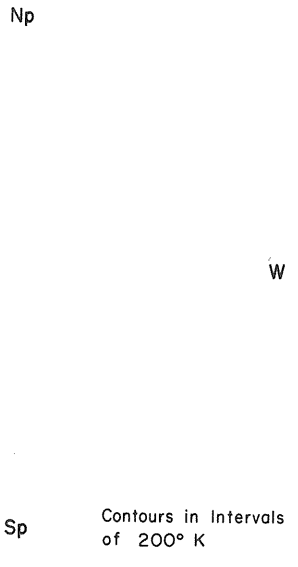
COUNT = 2558
ROLL = 105.3°
P-TH = 6.92

1228 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

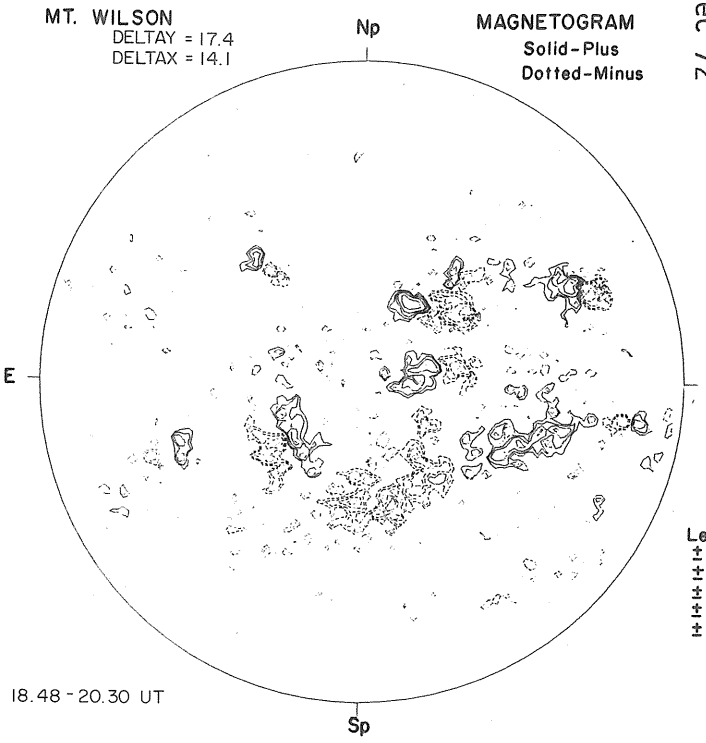
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.4
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

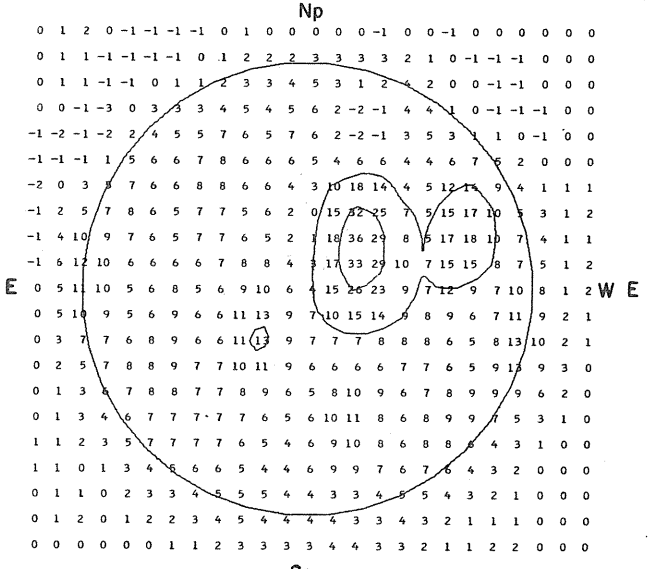


Levels
±5
±10
±20
±40
±80

18.48 - 20.30 UT

STANFORD

9.1 cm

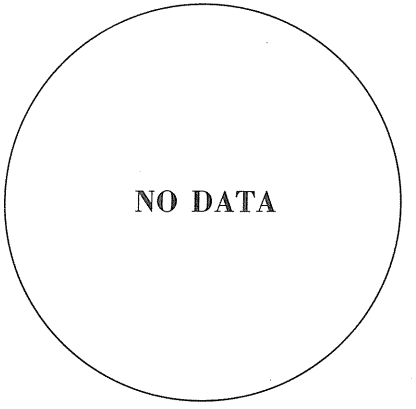


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

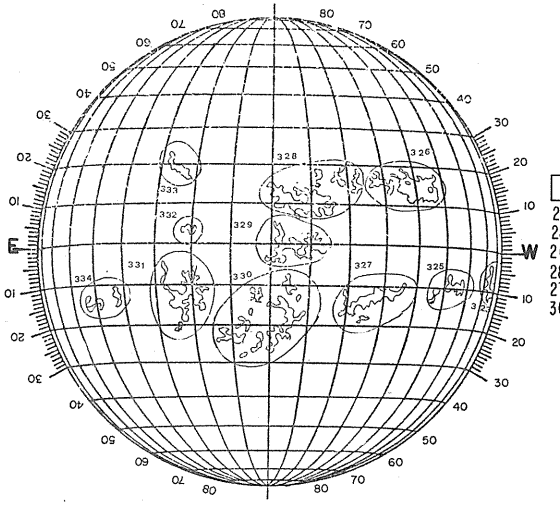


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

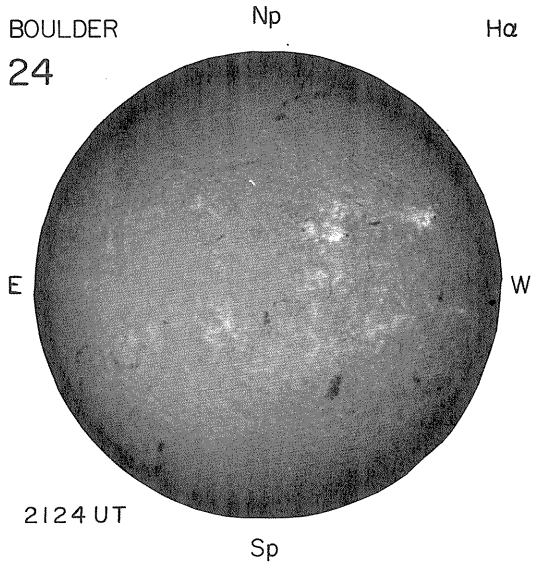
CALCIUM REPORT

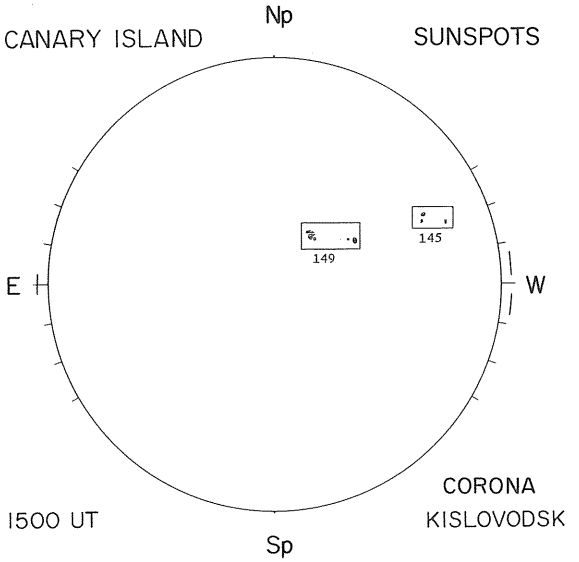
CATANIA

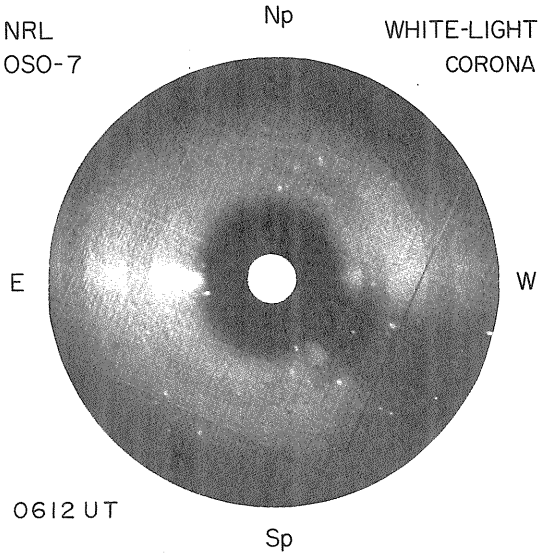


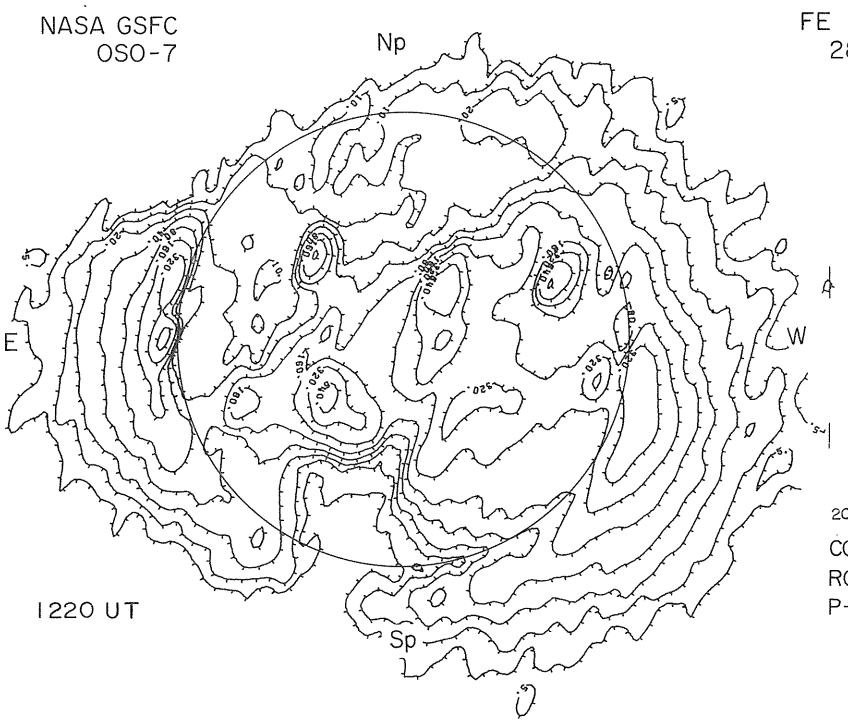
FAIR	GD
23 - 0961	---
25 - 0878	---
26 - 3336	---
28 - 3201	---
27 - 1680	---
30 - 2854	---

0815 UT

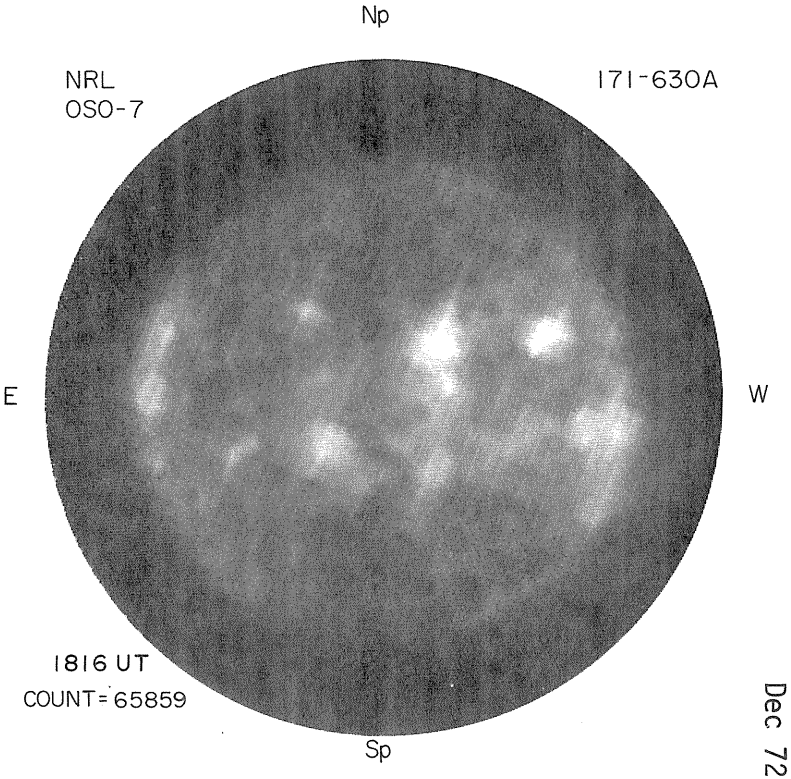








20 X 20 ARCSEC APERTURE
COUNT = 115265
ROLL = 105.3°
P-TH = 6.92

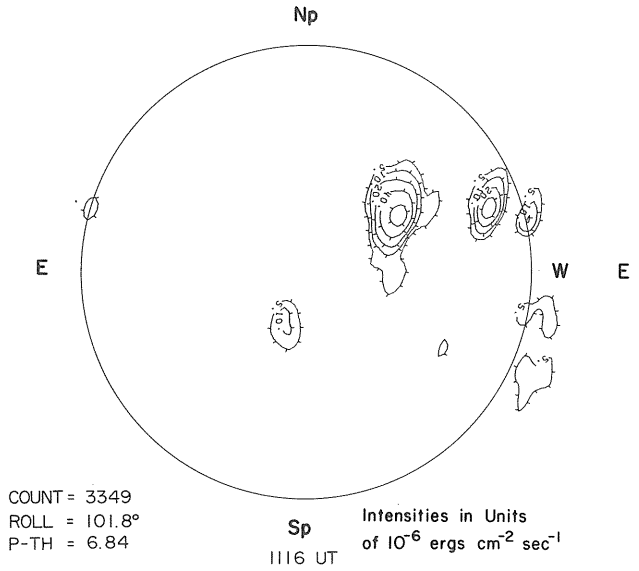


DECEMBER 25, 1972 (P = 5.47 B_o = -2.22 L_o = 293.52 MT. WILSON

70
Dec 72

NASA GSFC
OSO-7

X-RAY



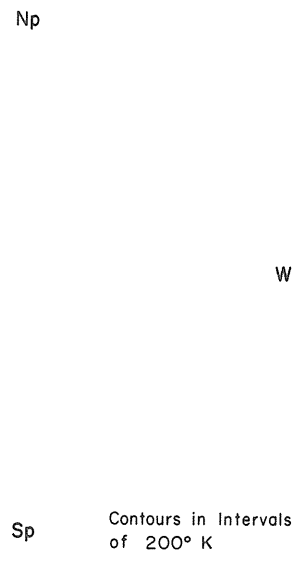
COUNT = 3349
ROLL = 101.8°
P-TH = 6.84

1116 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

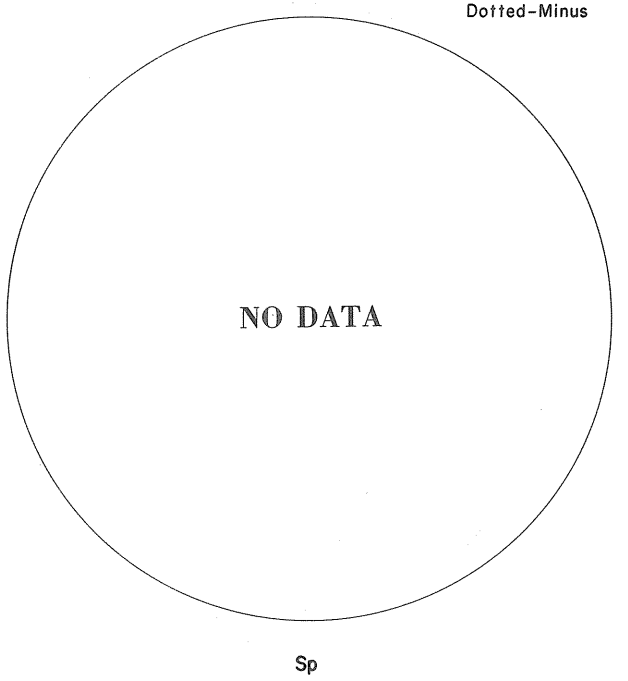
PROSPECT HILL
AFCRL

8.6 mm



Contours in Intervals of 200° K

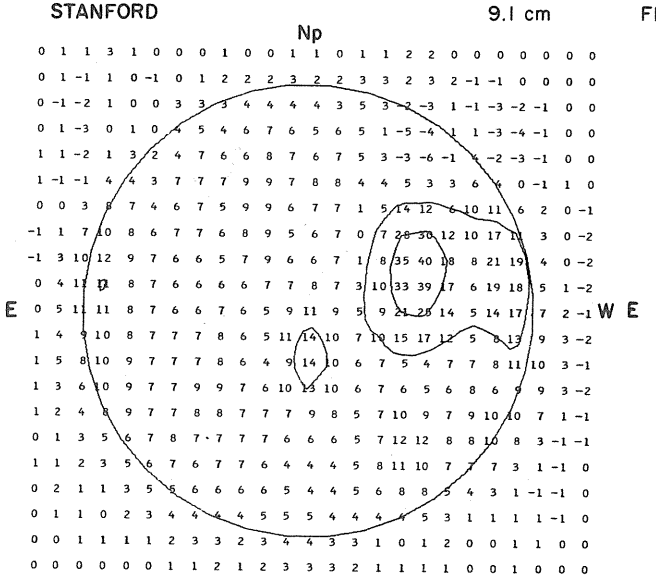
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

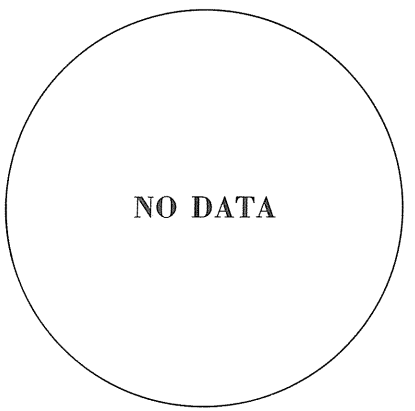


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

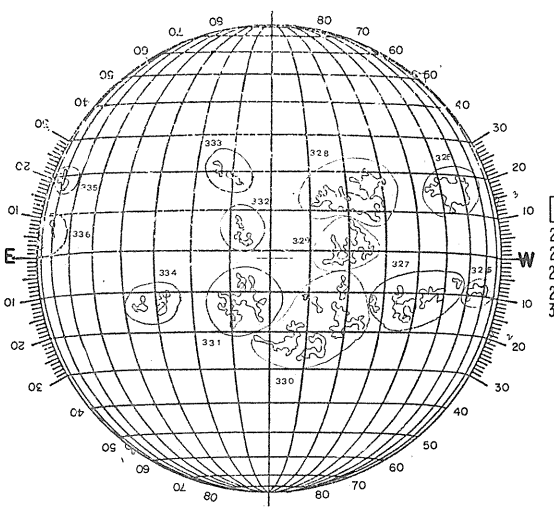


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

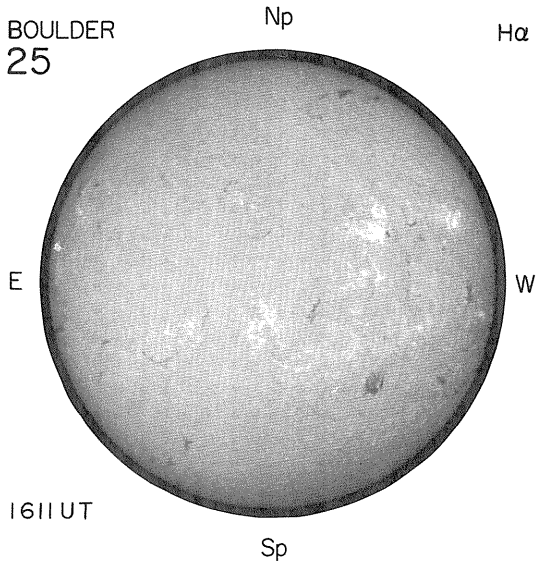
CALCIUM REPORT

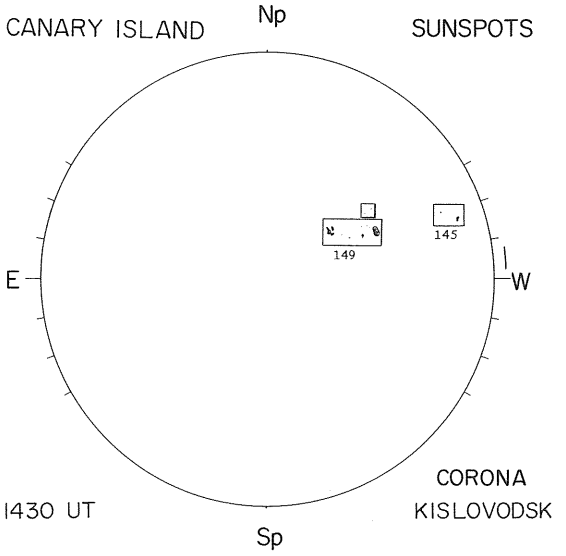
CATANIA

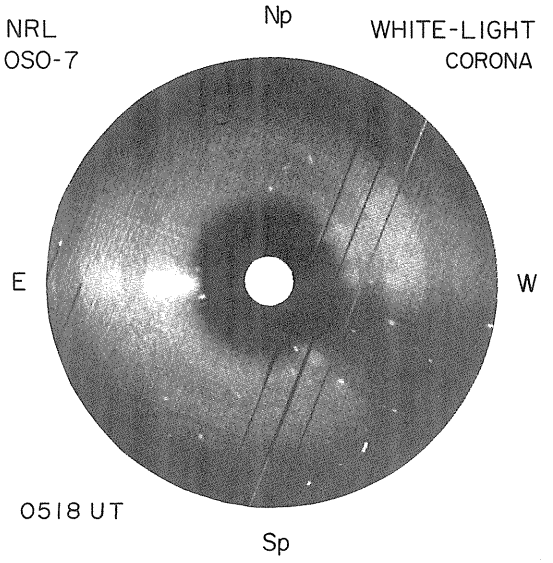


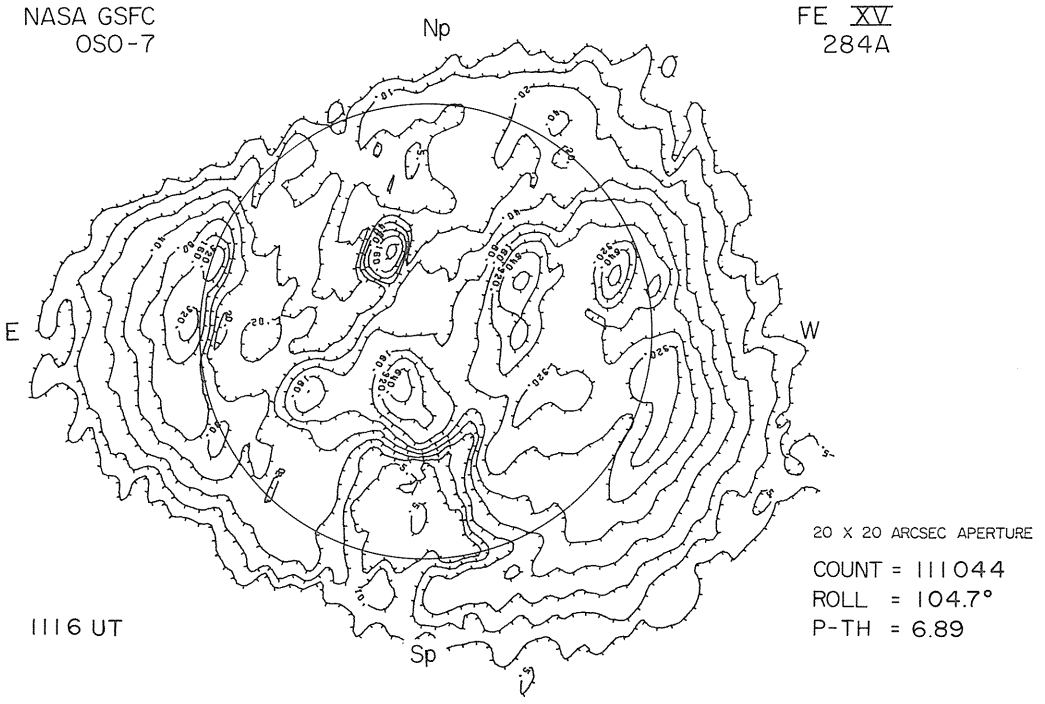
FAIR	GD
25 - 0869	---
26 - 3643	---
28 - 3341	---
27 - 1944	---
30 - 3335	---

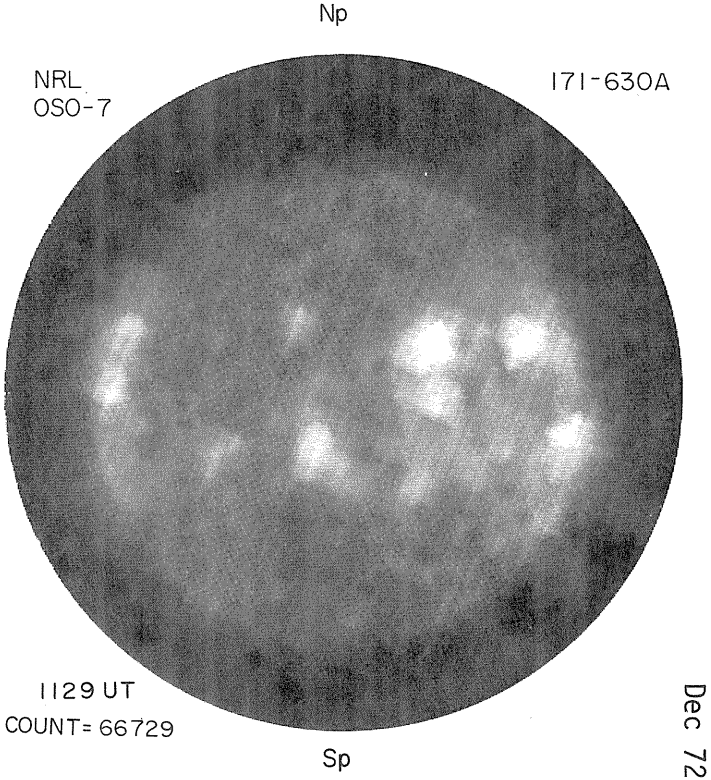
0825 UT


BOULDER
25
Np
Hα
E
W
1611 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
149
145
E
W
CORONA
KISLOVODSK
1430 UT
Sp


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
0518 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
1116 UT
Sp
20 X 20 ARCSEC APERTURE
COUNT = 111044
ROLL = 104.7°
P-TH = 6.89

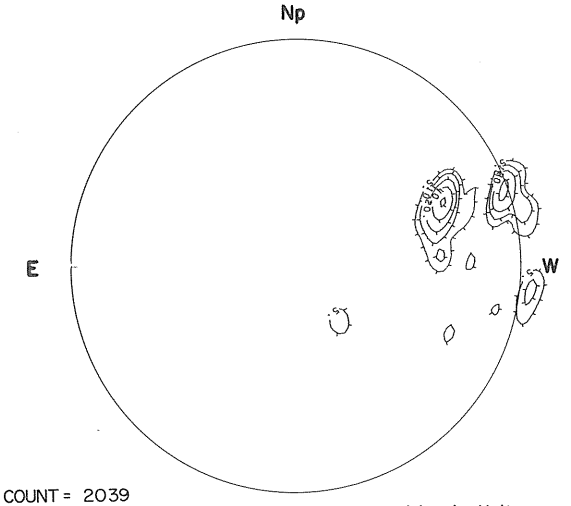

Np
NRL
OSO-7
171-630A
1129 UT
COUNT= 66729
Sp

71
Dec 72

DECEMBER 26, 1972 (P = 4.99 B_o = -2.35 L_o = 280.34

NASA GSFC
OSO-7

X-RAY



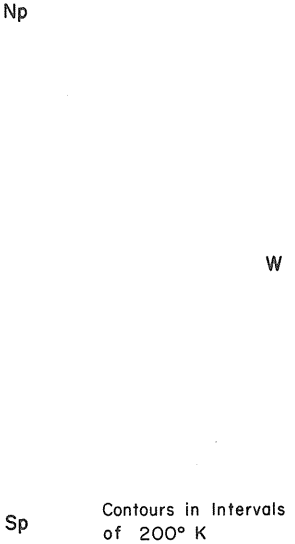
COUNT = 2039
ROLL = 99.0°
P-TH = 6.81

1520 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

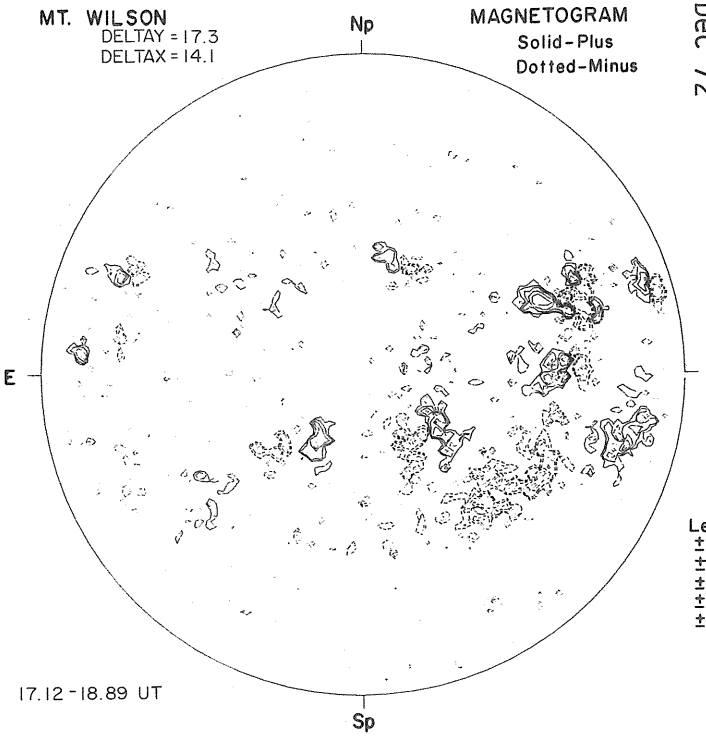


Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.3
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

72
Dec 72

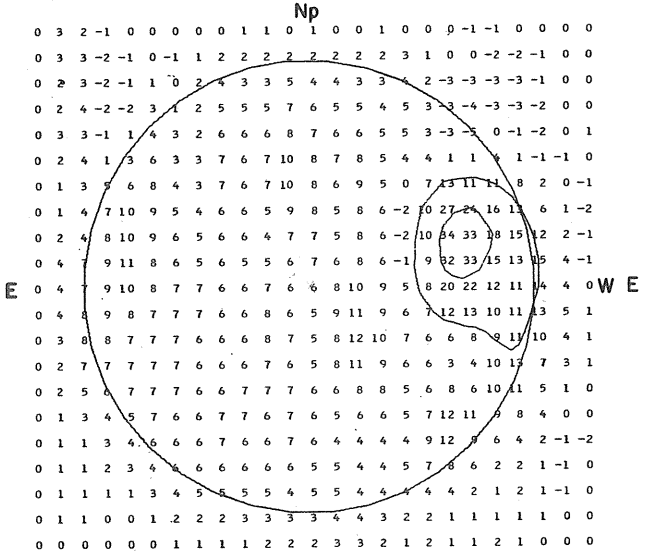


Levels
±5
±10
±20
±40
±80

17.12-18.89 UT

STANFORD

9.1 cm

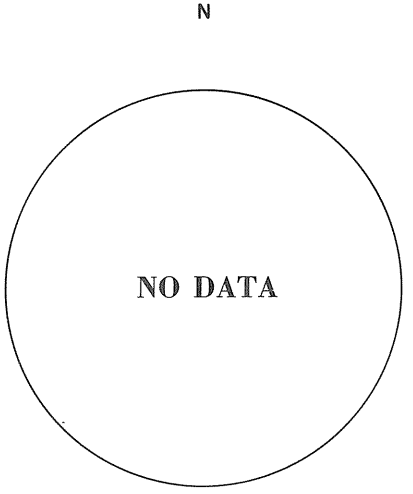


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

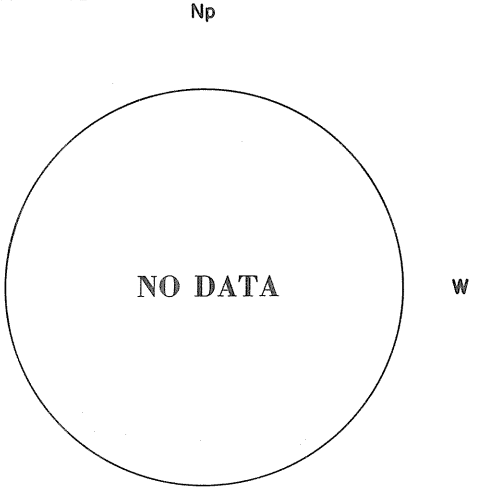
21 cm



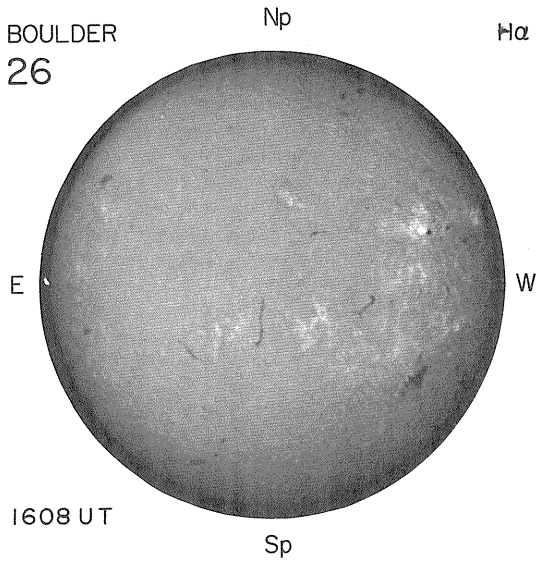
02-03 UT

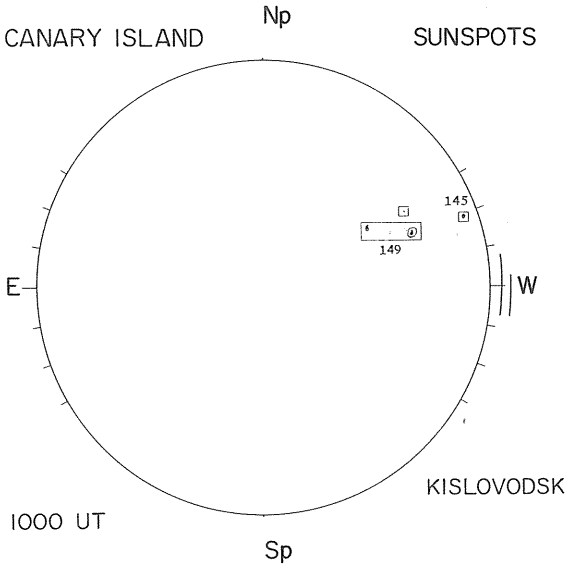
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

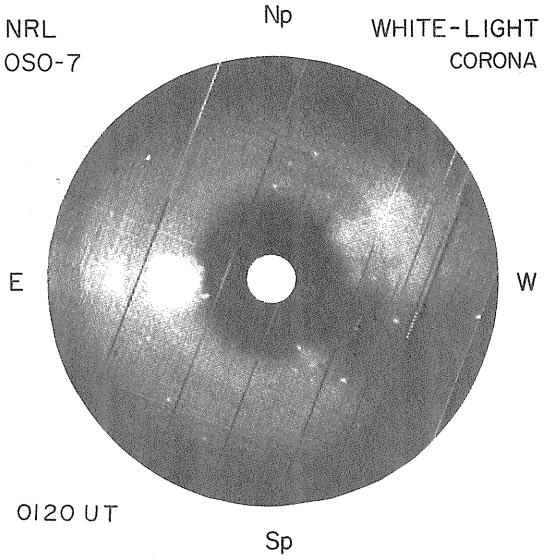
McMATH-HULBERT

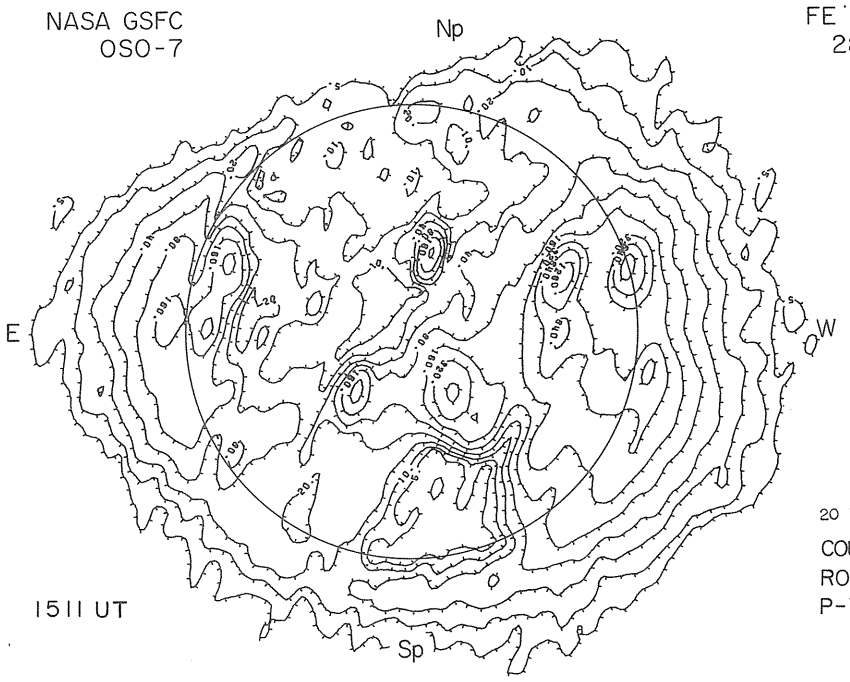


CALCIUM REPORT

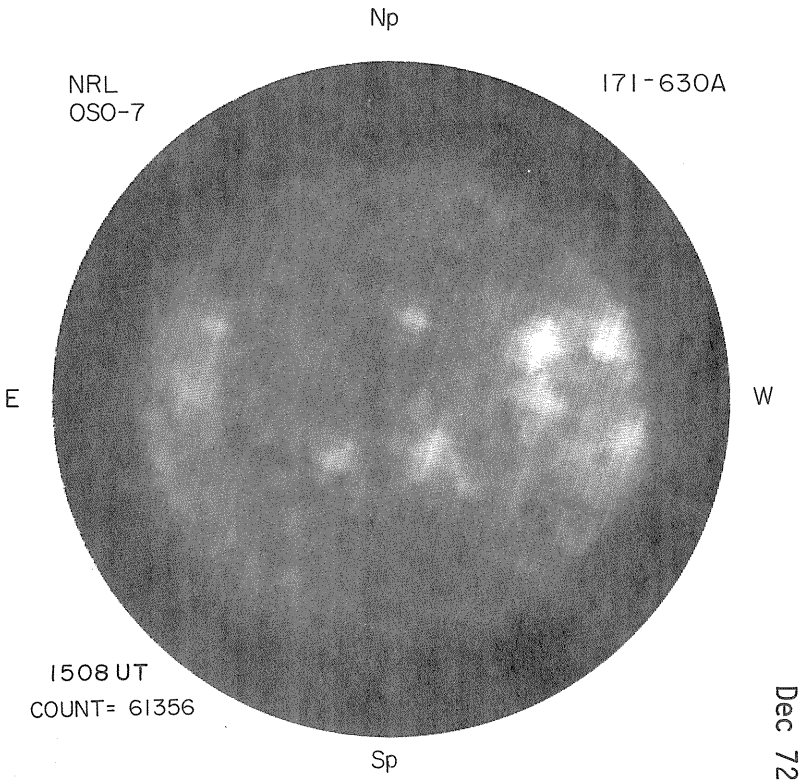








20 X 20 ARCSEC APERTURE
COUNT = 103160
ROLL = 101.8°
P-TH = 6.84

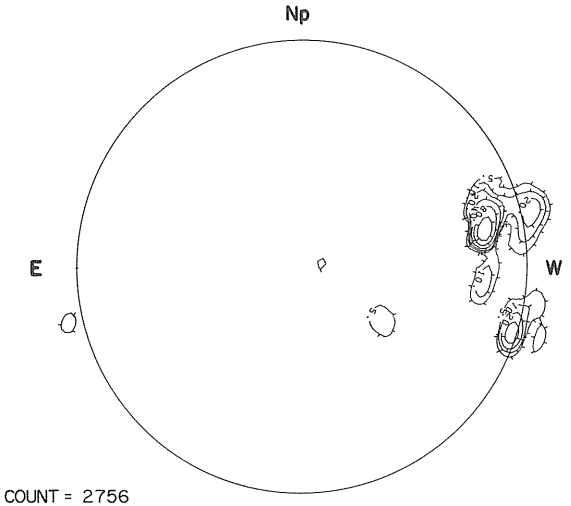


DECEMBER 27, 1972 (P = 4.51 B_o = -2.47 L_o = 267.17

74
Dec 72

NASA GSFC
OSO-7

X-RAY



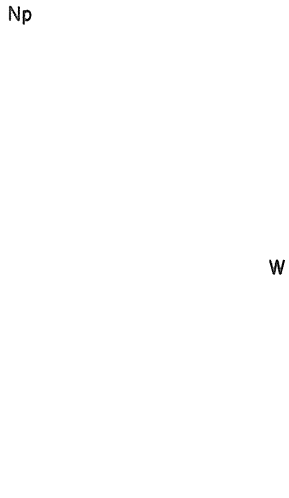
COUNT = 2756
ROLL = 99.0°
P-TH = 6.81

1118 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

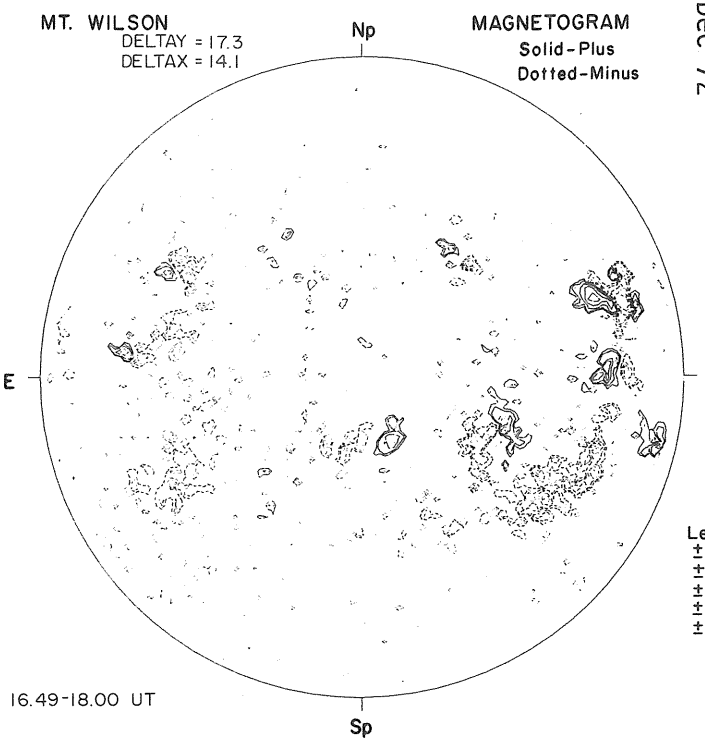
8.6 mm



Contours in Intervals of 200° K

MT. WILSON
DELTAY = 17.3
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

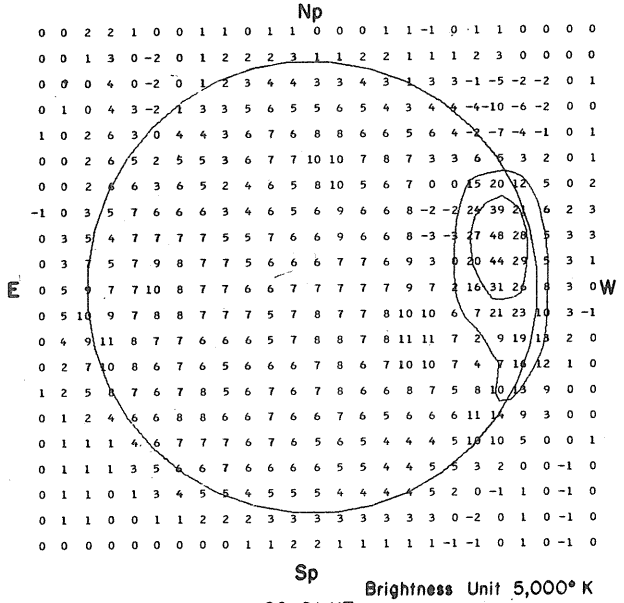


Levels
±5
±10
±20
±40
±80

16.49-18.00 UT

STANFORD

9.1 cm

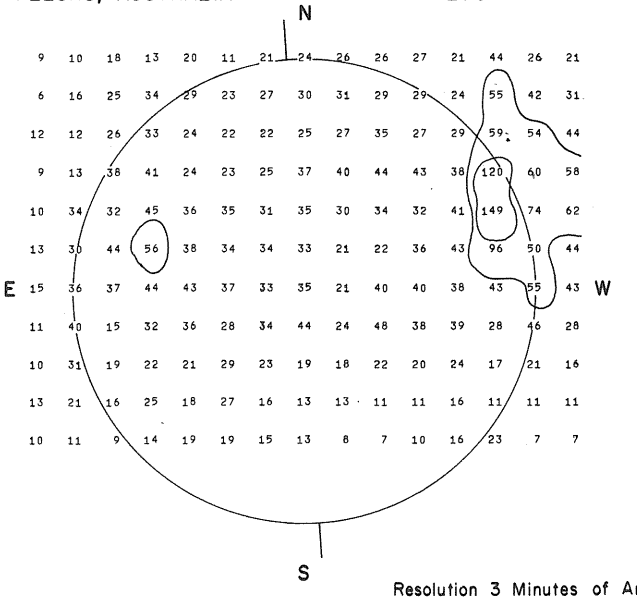


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

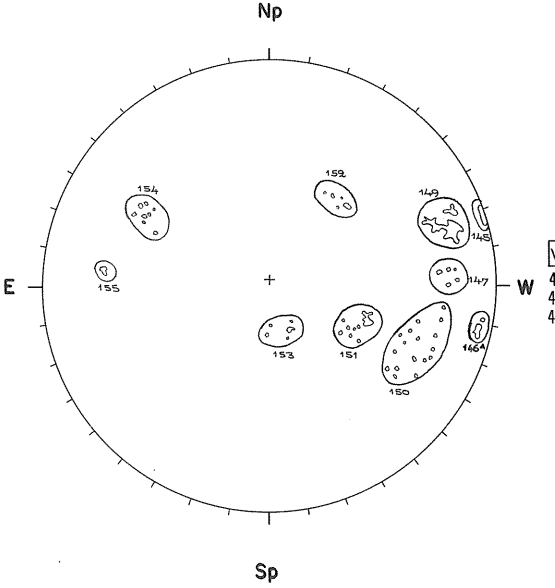


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

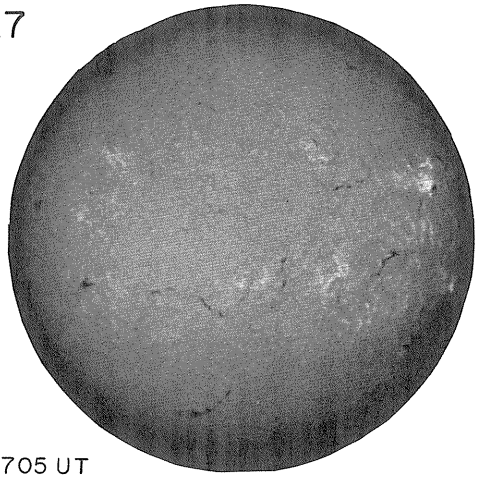
CALCIUM REPORT



VPOOR	M
45 - 1100	-2.5
46 - 0800	-3.0
49 - 2300	-3.5

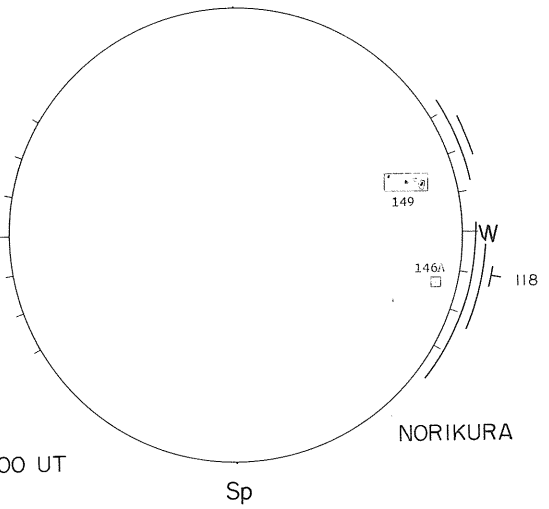
1700 UT

BOULDER
27



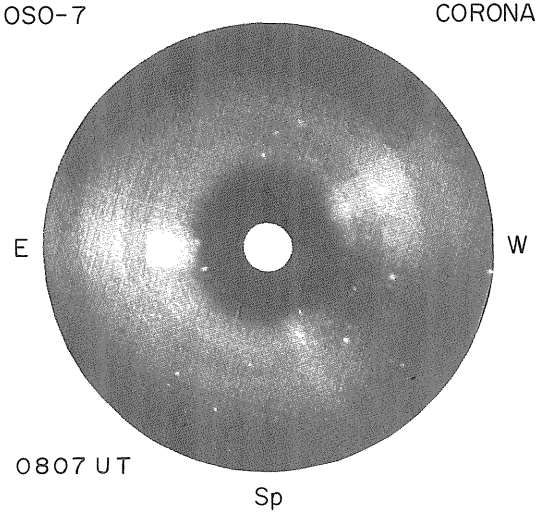
1705 UT

CANARY ISLAND



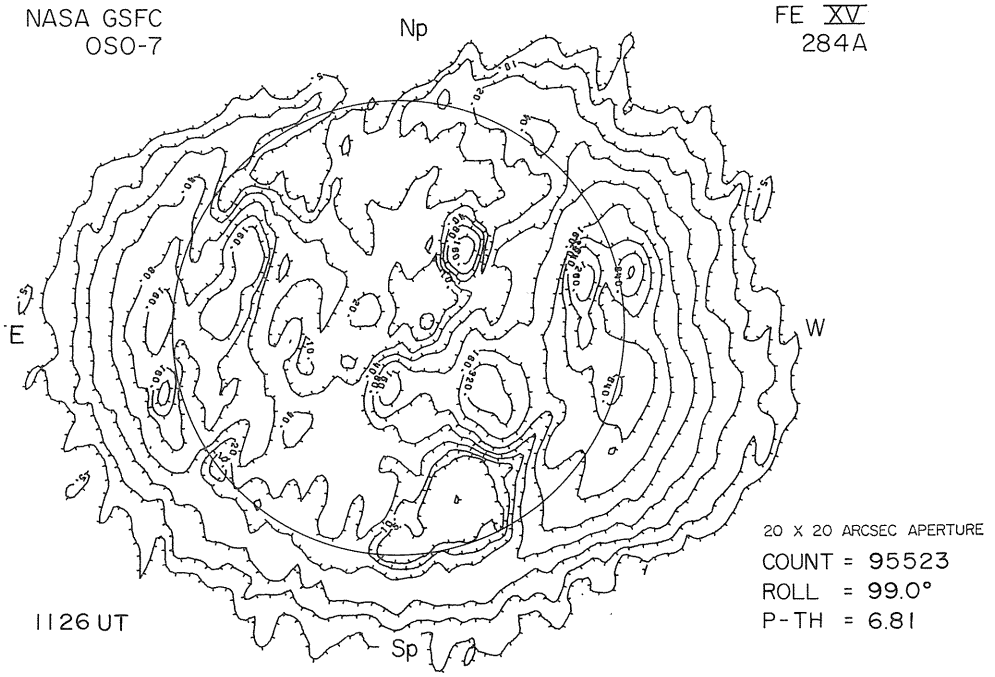
0900 UT

NRL
OSO-7



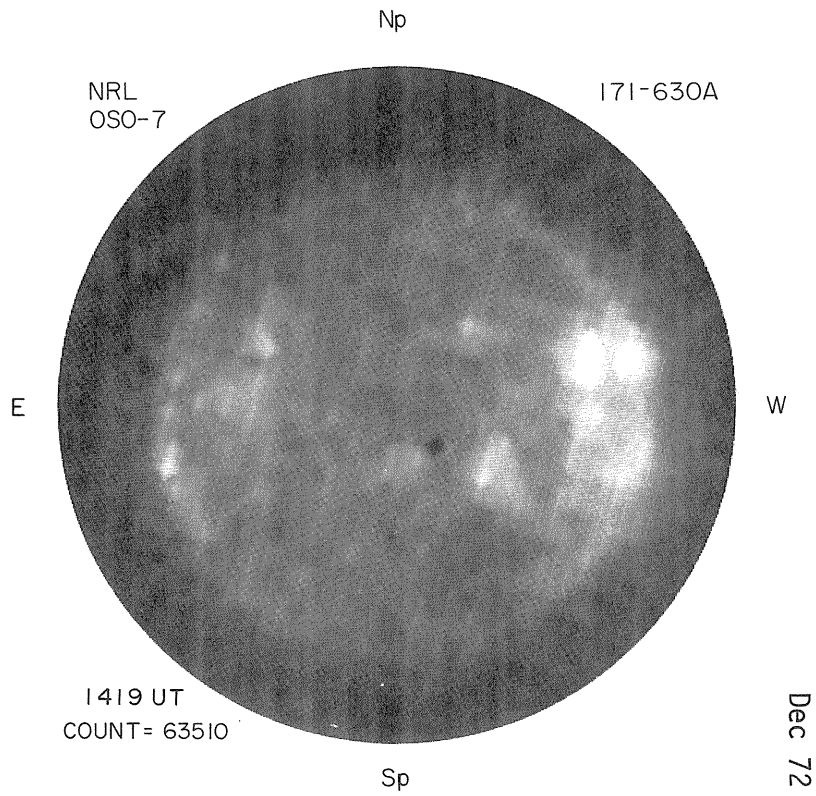
0807 UT

NASA GSFC
OSO-7



1126 UT

NRL
OSO-7

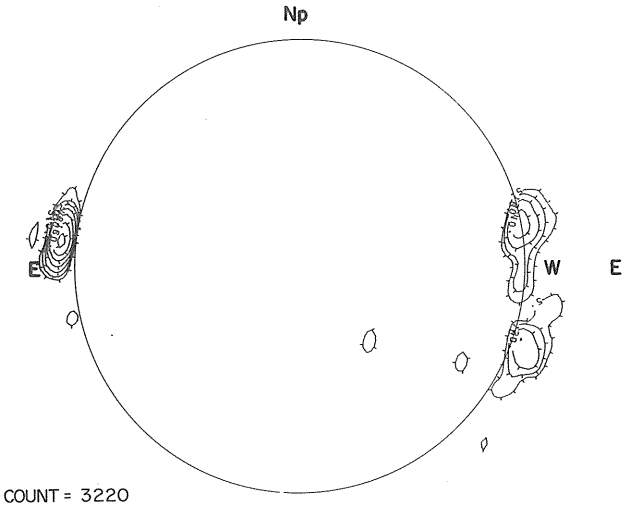


1419 UT
COUNT= 63510

DECEMBER 28, 1972 (P = 4.03 B_o = -2.59 L_o = 254.00

NASA GSFC
OSO-7

X-RAY



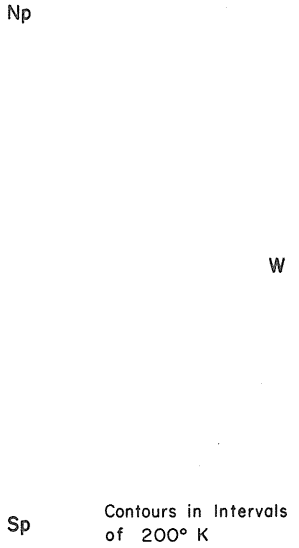
COUNT = 3220
ROLL = 94.9°
P-TH = 6.74

2245 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

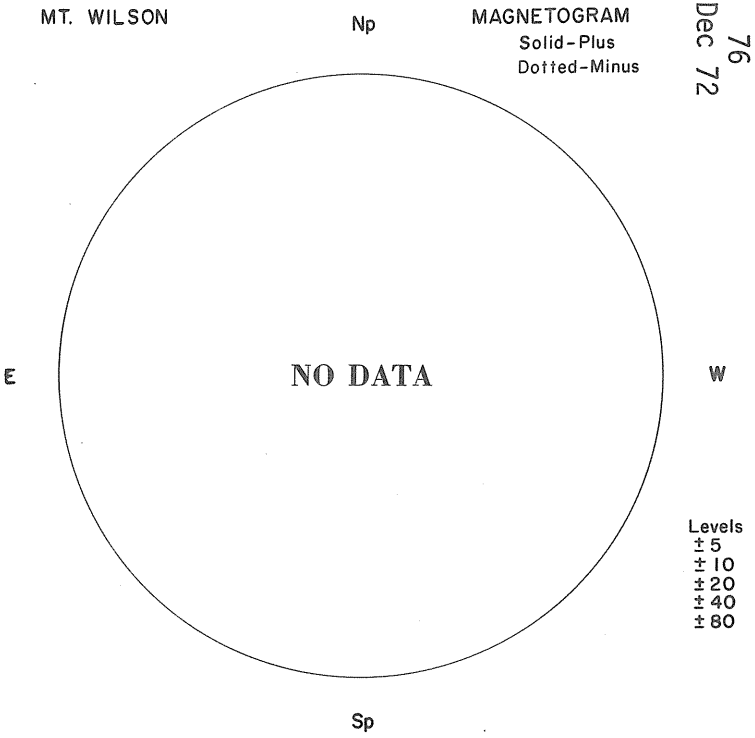
8.6 mm



Contours in Intervals of 200° K

MT. WILSON

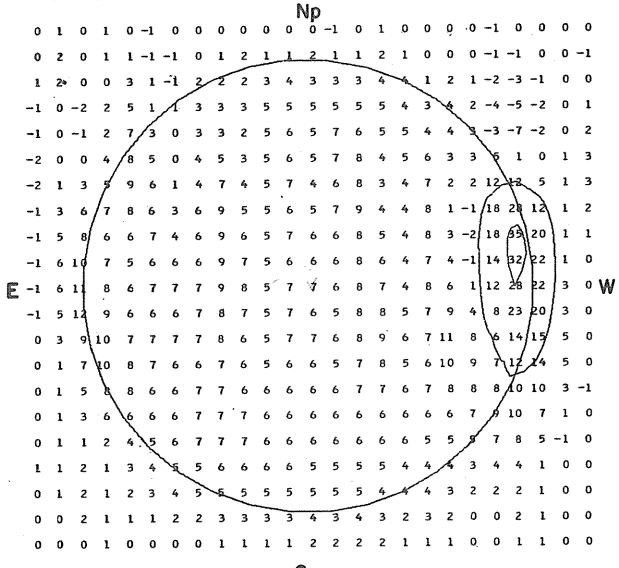
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

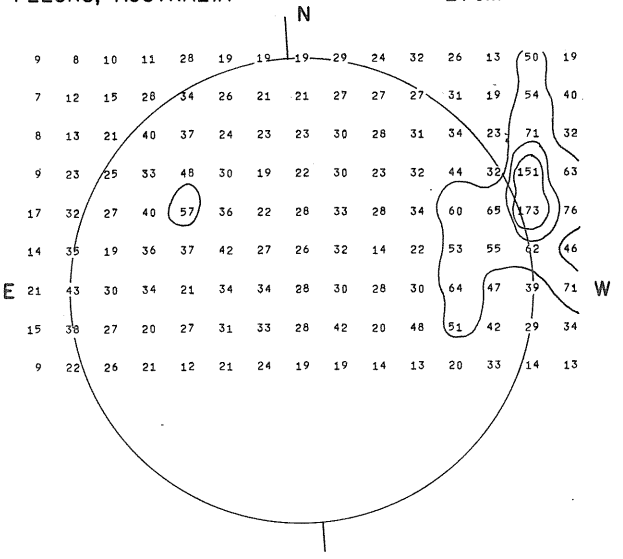


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

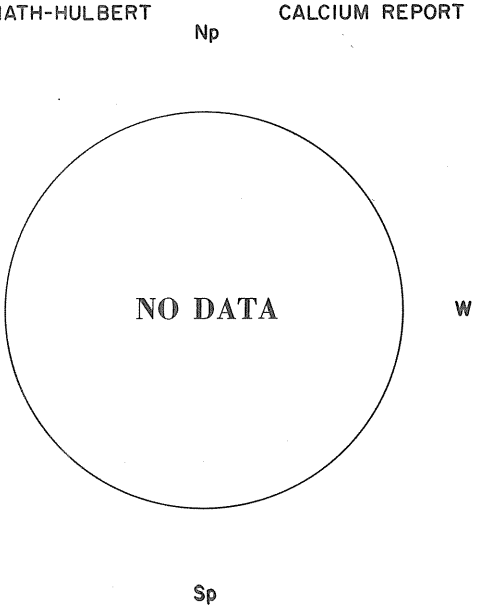


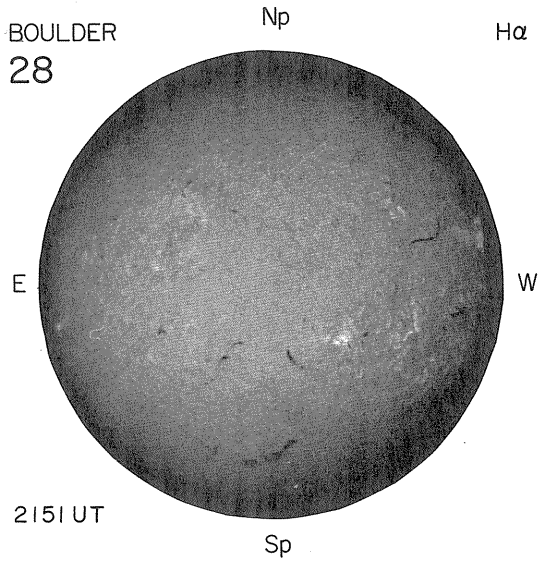
02-03 UT

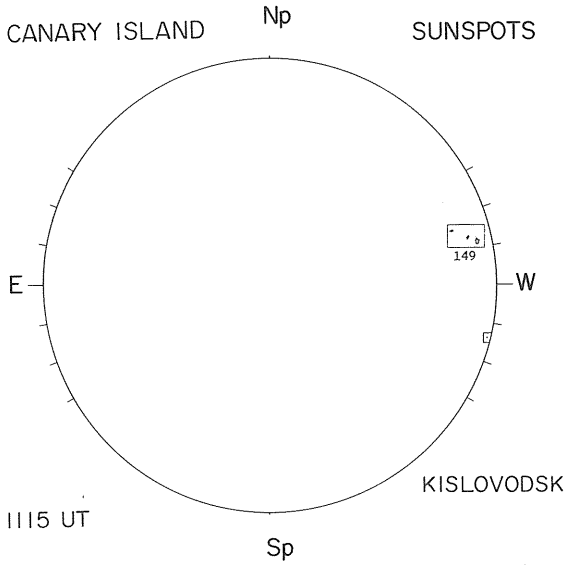
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

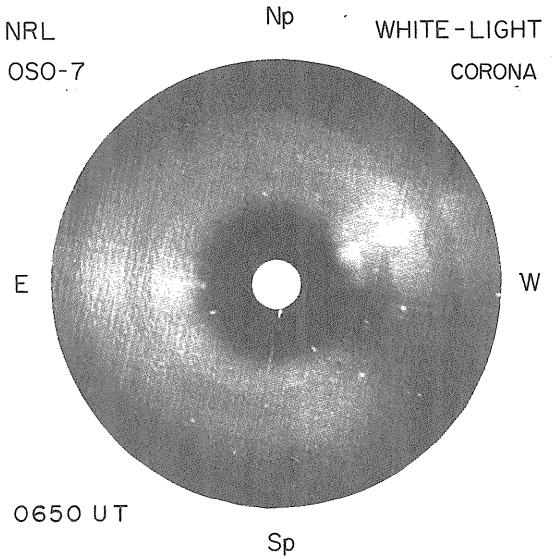
McMATH-HULBERT

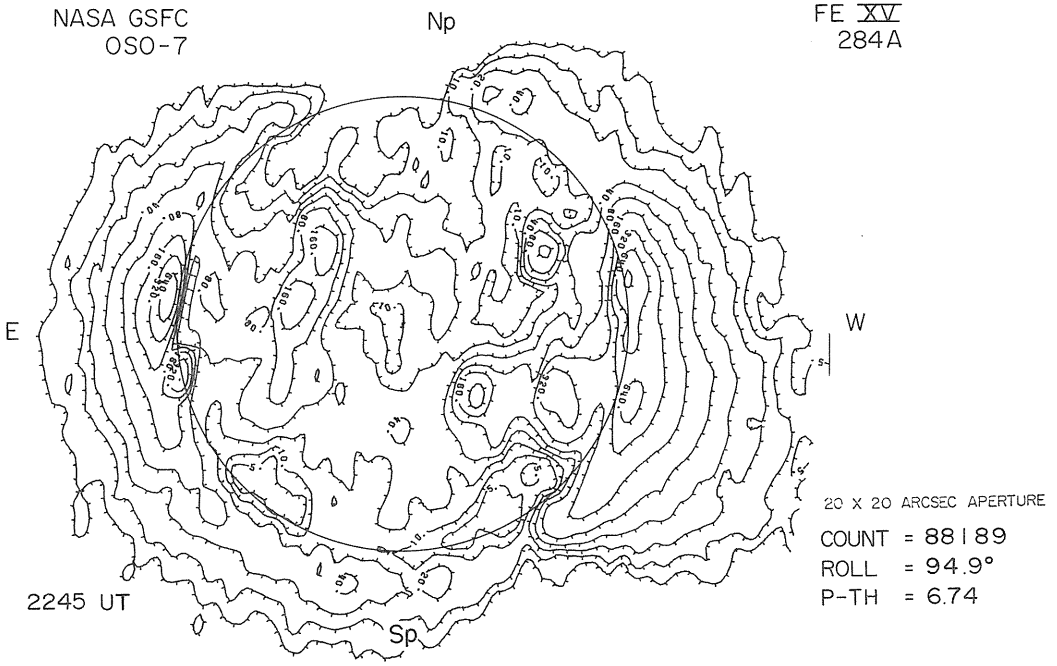
CALCIUM REPORT

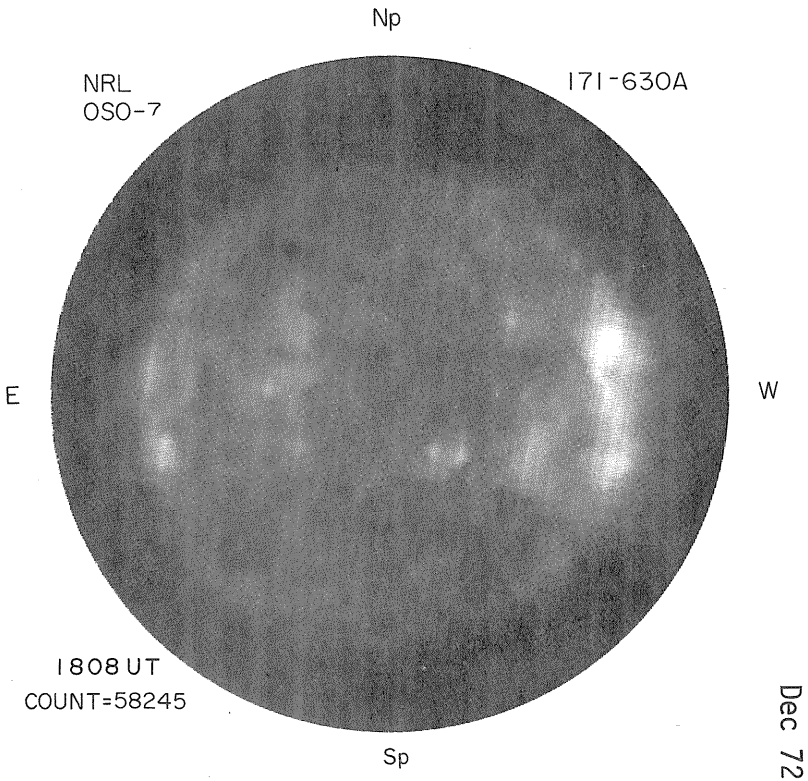



BOULDER
28
Np
Hα
E
W
2151 UT
Sp


CANARY ISLAND
Np
SUNSPOTS
149
E
W
KISLOVODSK
1115 UT
Sp


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
0650 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
2245 UT
Sp
20 X 20 ARCSEC APERTURE
COUNT = 88189
ROLL = 94.9°
P-TH = 6.74

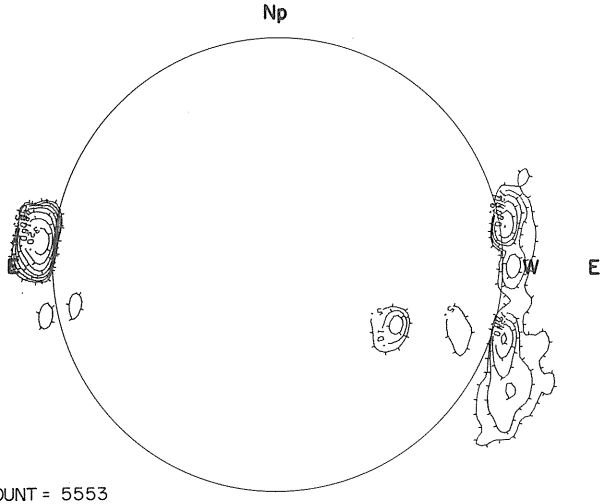

Np
NRL
OSO-7
171-630A
E
W
1808 UT
COUNT=58245
Sp

77
Dec 72

DECEMBER 29, 1972 (P = 3.54 B_o = -2.71 L_o = 240.83 MT. WILSON

NASA GSFC
OSO-7

X-RAY



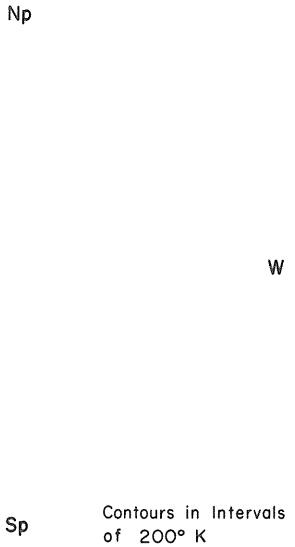
COUNT = 5553
ROLL = 90.4°
P-TH = 6.71

1527 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

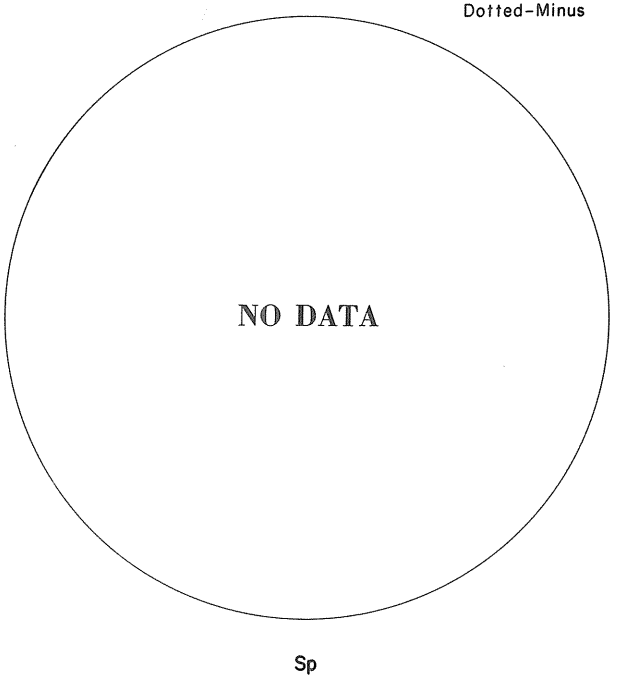
PROSPECT HILL
AFCRL

8.6 mm



Contours in Intervals of 200° K

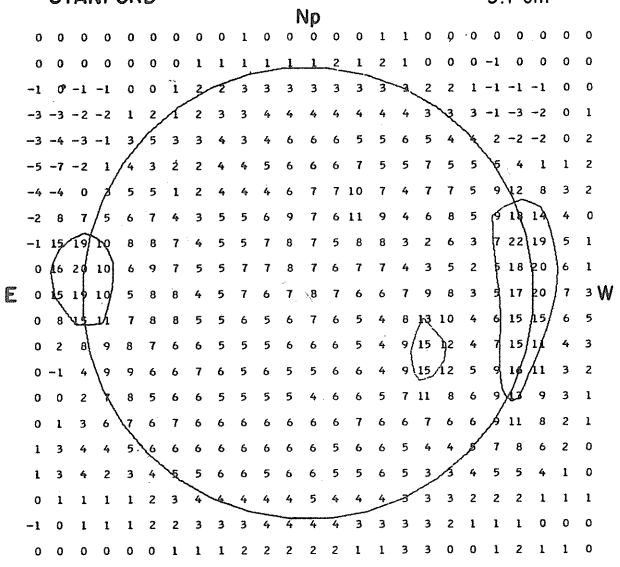
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

STANFORD

9.1 cm

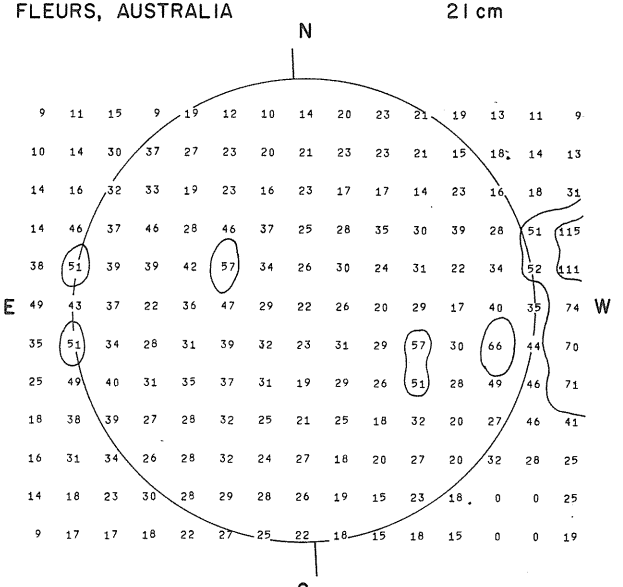


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

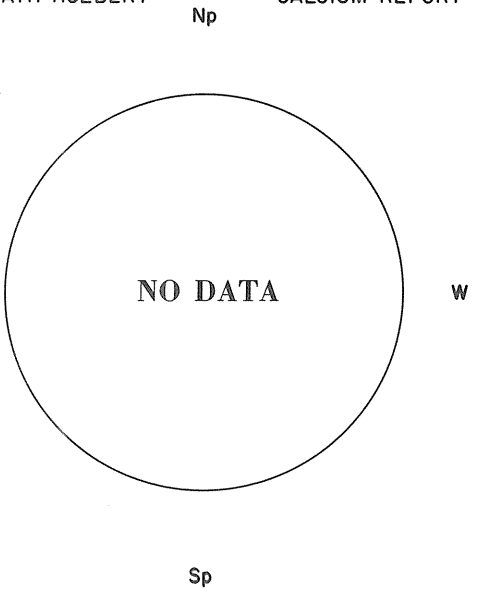


02-03 UT

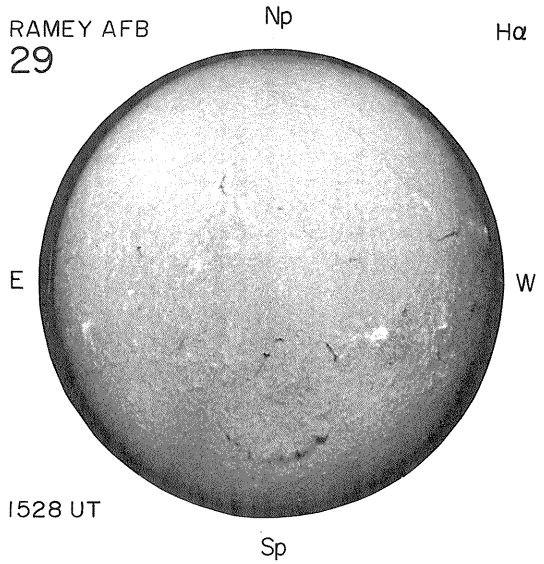
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

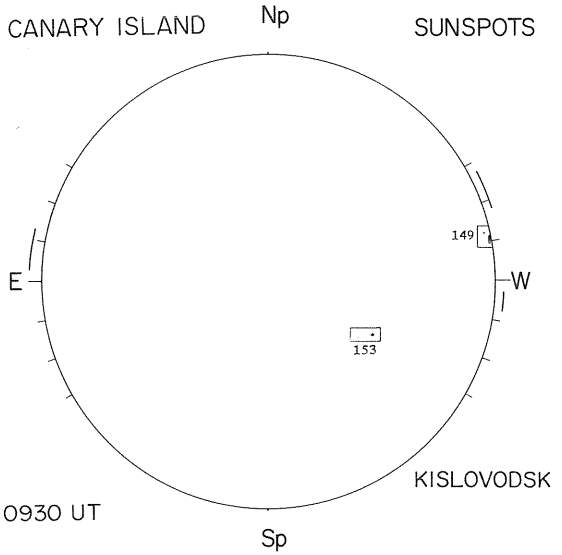
CALCIUM REPORT



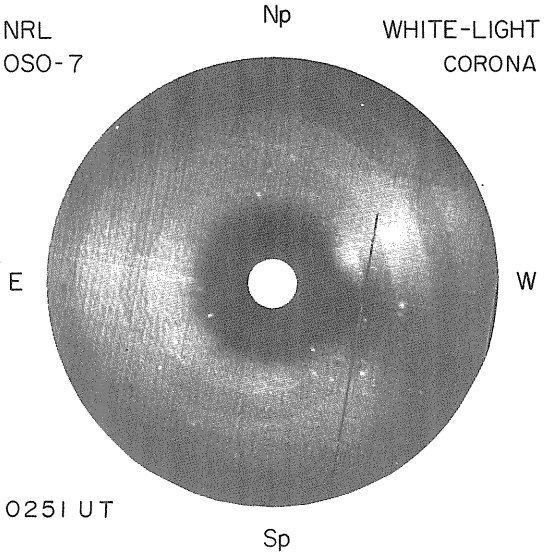
RAMEY AFB
29



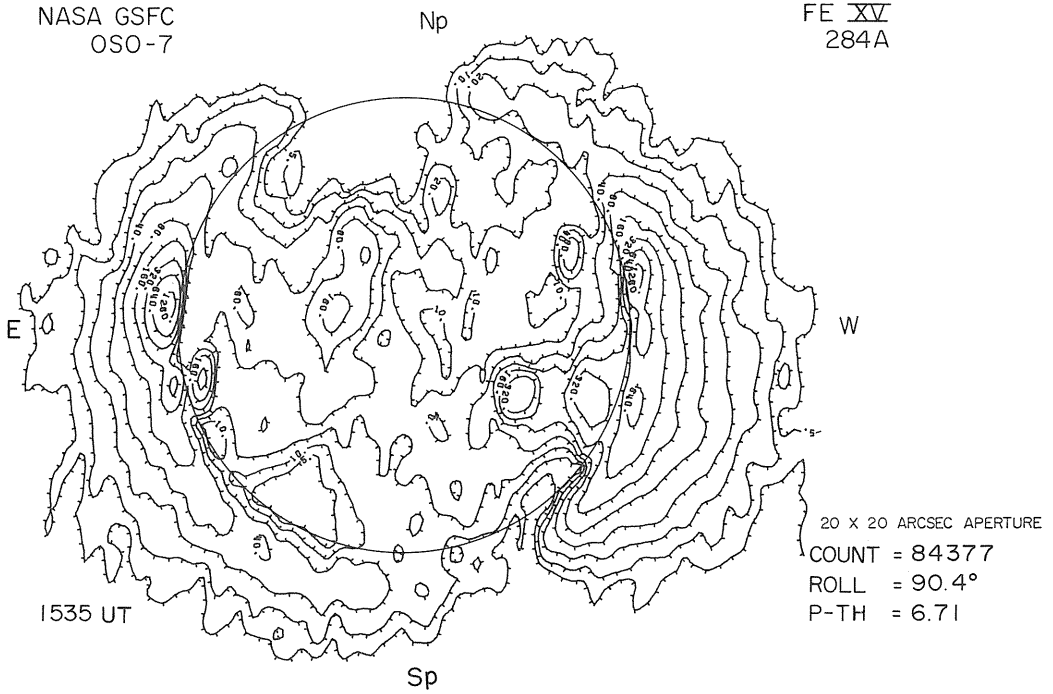
CANARY ISLAND



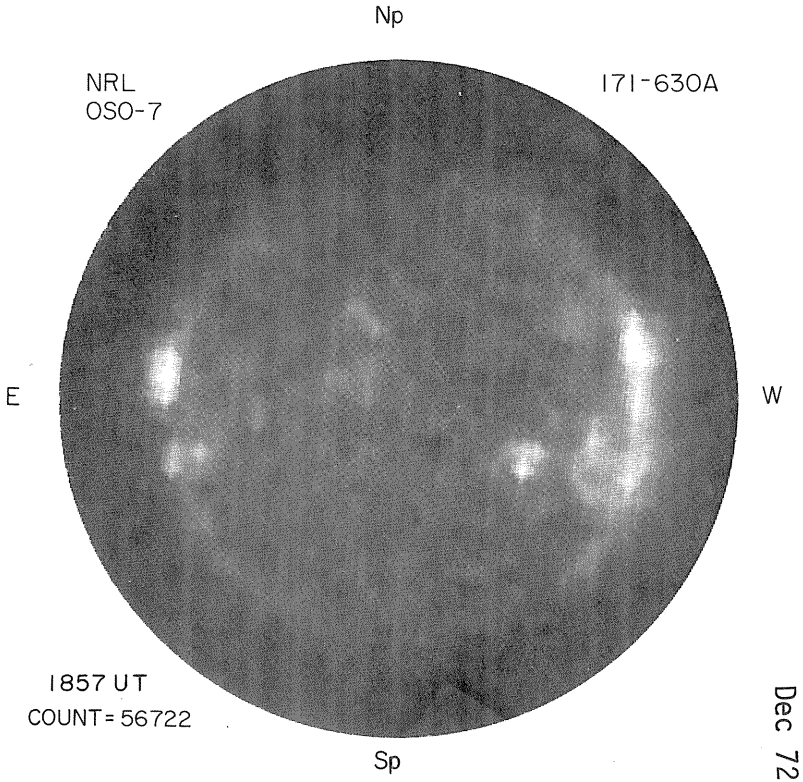
NRL
OSO-7



NASA GSFC
OSO-7



NRL
OSO-7



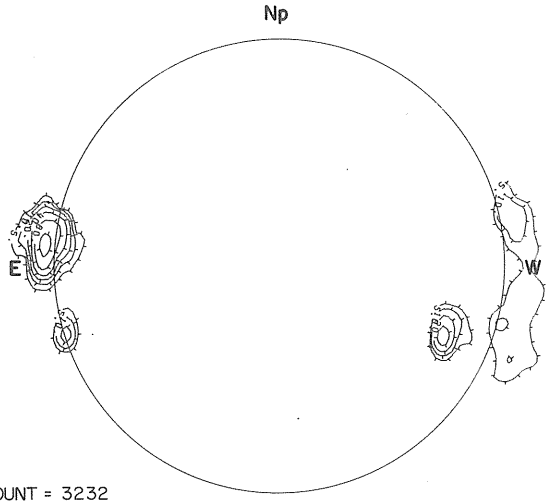
79
Dec 72

DECEMBER 30, 1972 (P = 3.06 B_o = -2.83 L_o = 227.66

80
Dec 72

NASA GSFC
OSO-7

X-RAY



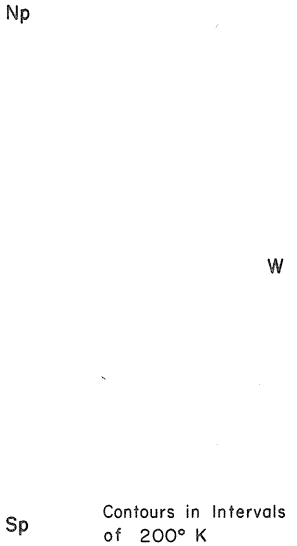
COUNT = 3232
ROLL = 87.0°
P-TH = 6.65

2204 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

PROSPECT HILL
AFCRL

8.6 mm

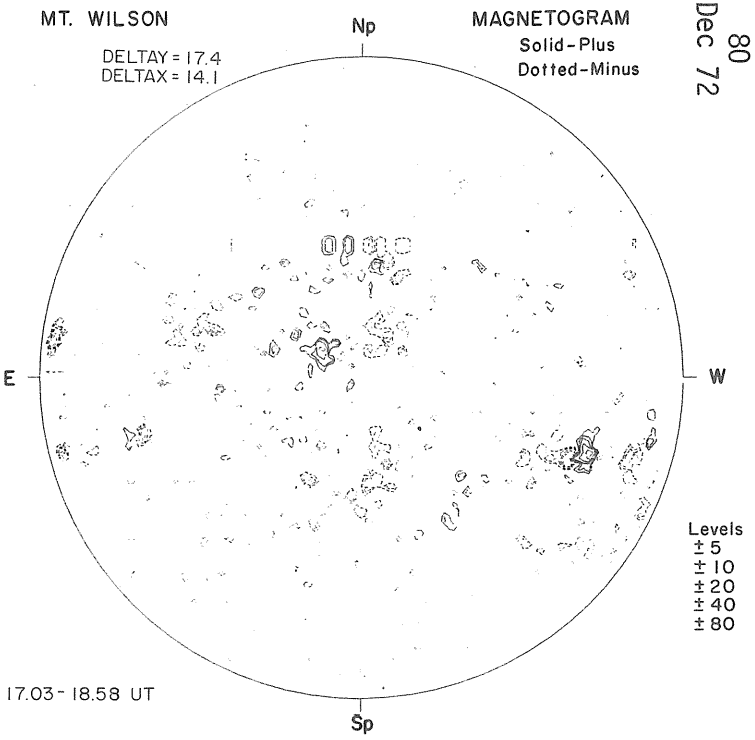


Contours in Intervals of 200° K

MT. WILSON

MAGNETOGRAM
Solid-Plus
Dotted-Minus

DELTAY = 17.4
DELTAX = 14.1

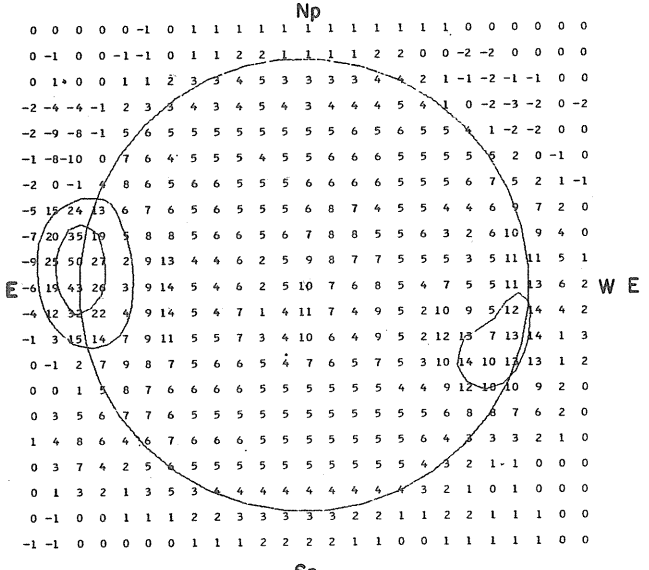


Levels
±5
±10
±20
±40
±80

17.03-18.58 UT

STANFORD

9.1 cm

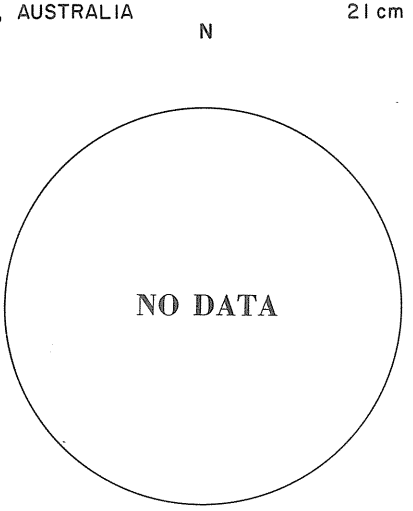


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

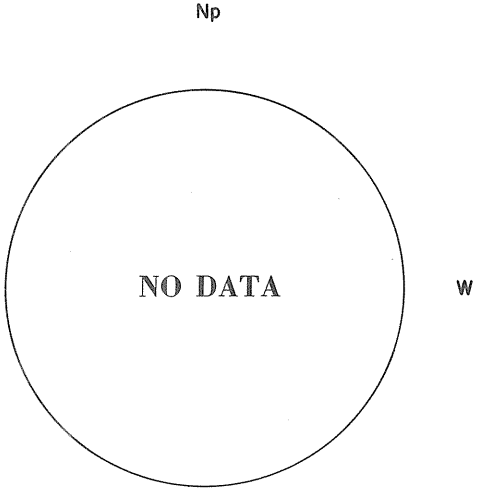


02-03 UT

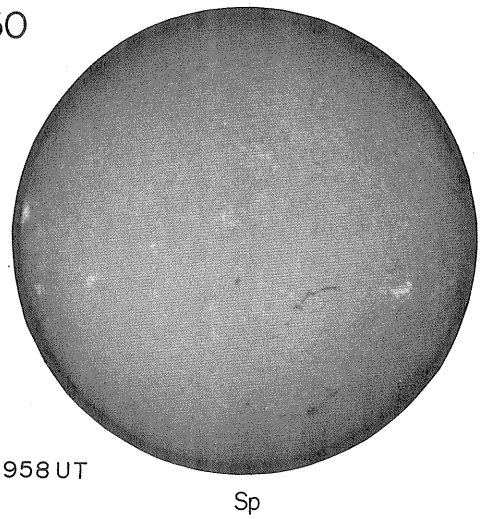
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT

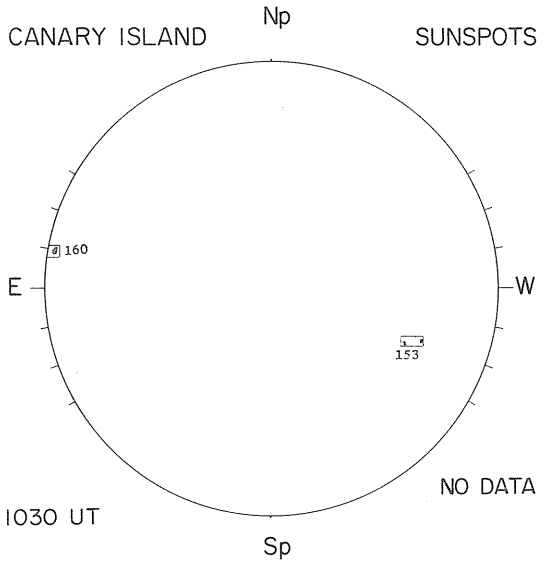
CALCIUM REPORT



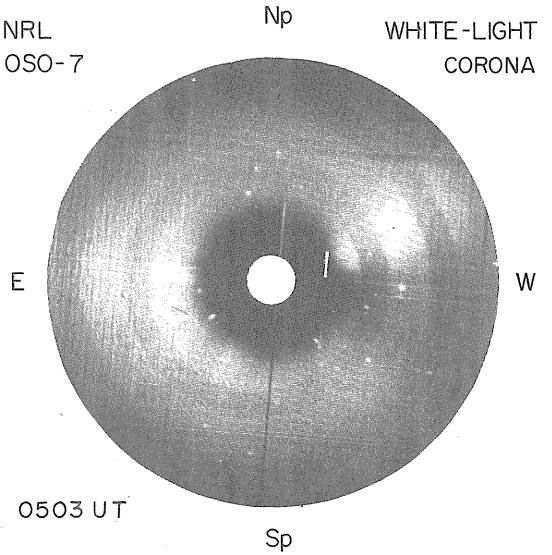
BOULDER
30



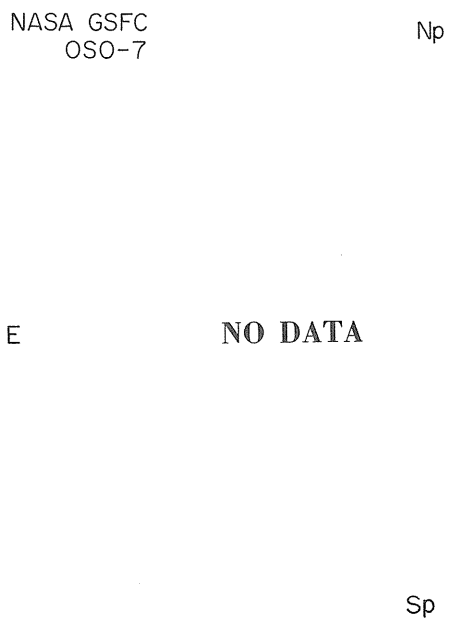
CANARY ISLAND



NRL
OSO-7

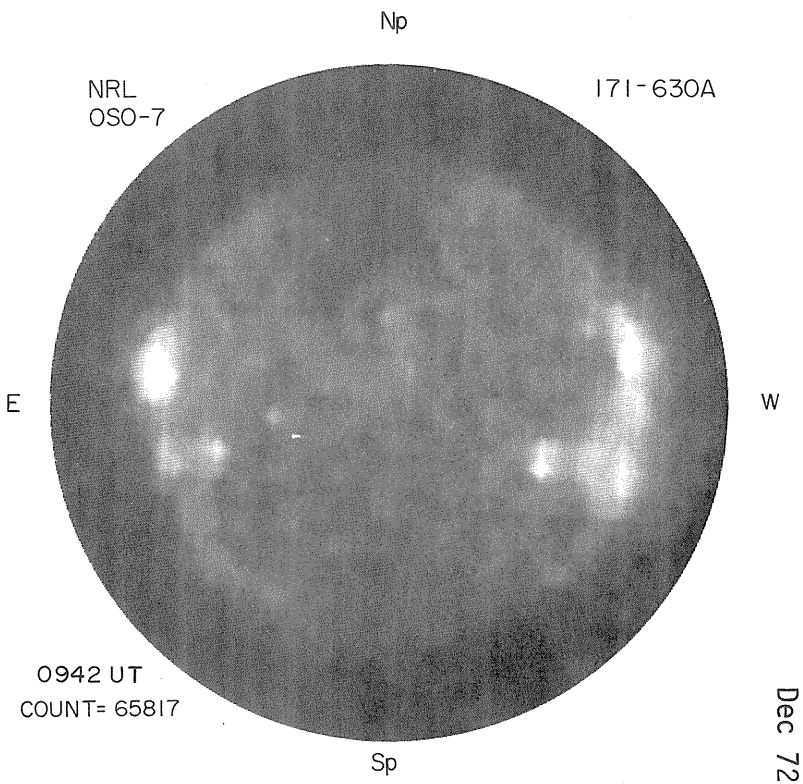


NASA GSFC
OSO-7



FE XV
284A

NRL
OSO-7

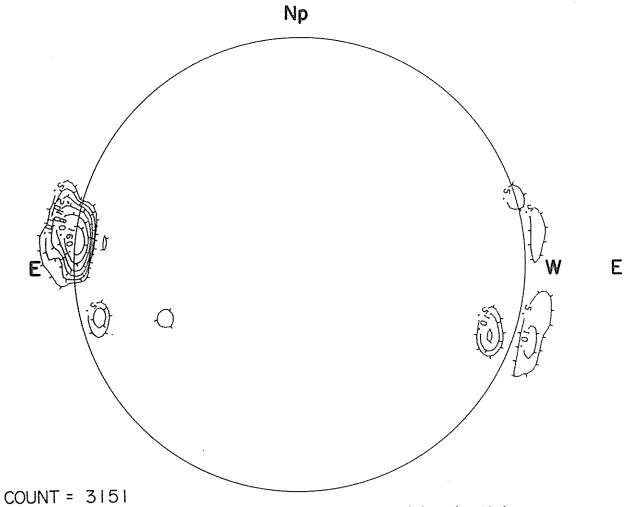


DECEMBER 31, 1972 (P= 2.57 B_o = -2.95 L_o = 214.49 MT. WILSON

82
Dec 72

NASA GSFC
OSO-7

X-RAY



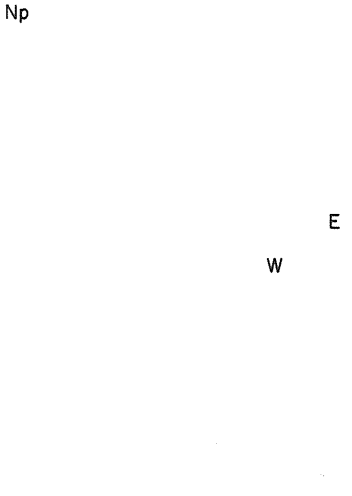
COUNT = 3151
ROLL = 86.7°
P-TH = 6.62

1200 UT

Intensities in Units of 10^{-6} ergs cm^{-2} sec^{-1}

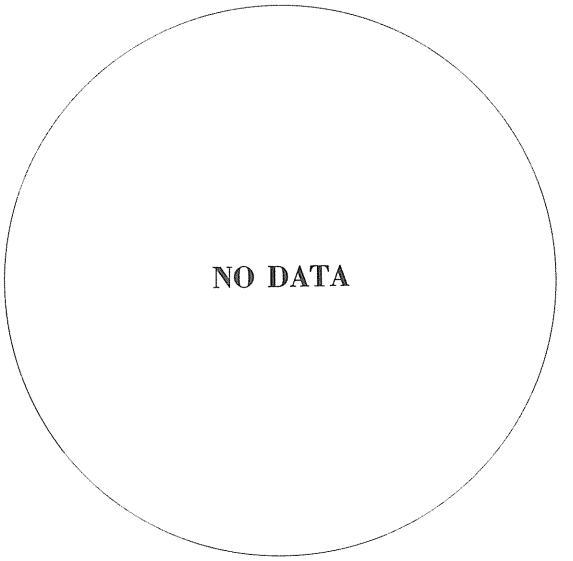
PROSPECT HILL
AFCRL

8.6 mm



Contours in Intervals of 200° K

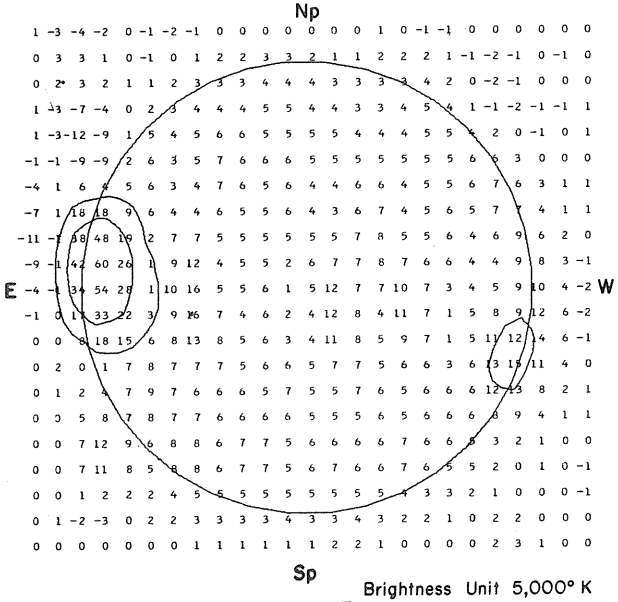
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
± 5
± 10
± 20
± 40
± 80

STANFORD

9.1 cm

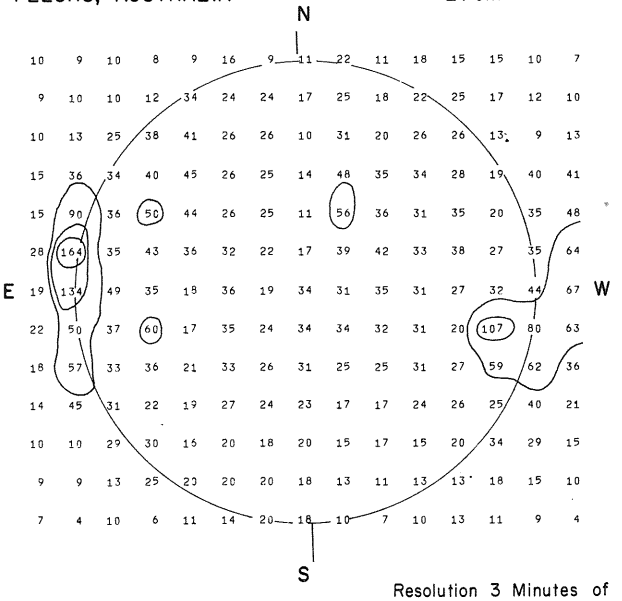


20-21 UT

Brightness Unit 5,000° K

FLEURS, AUSTRALIA

21 cm

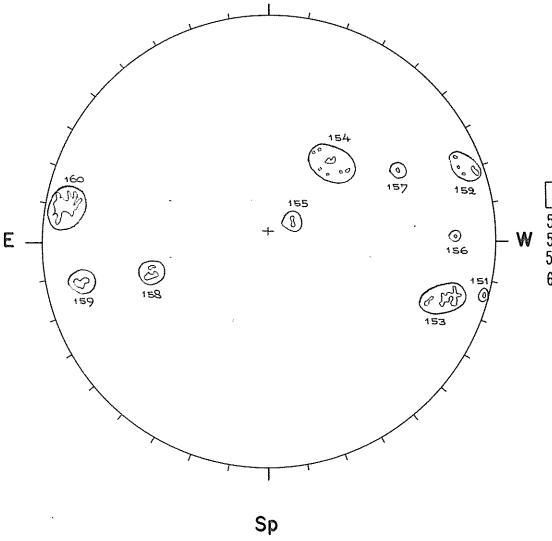


02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

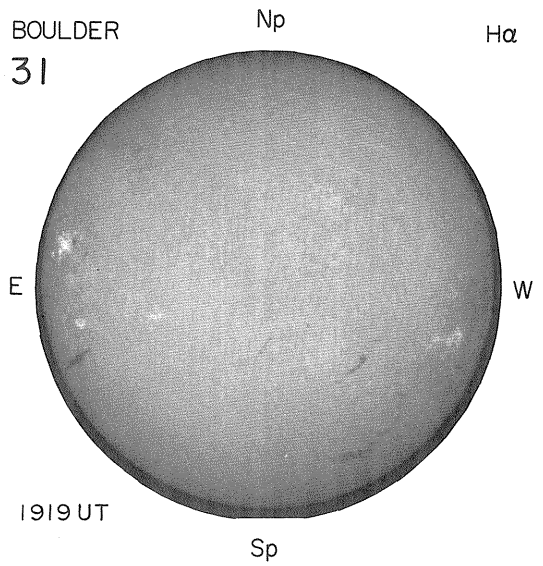
McMATH-HULBERT

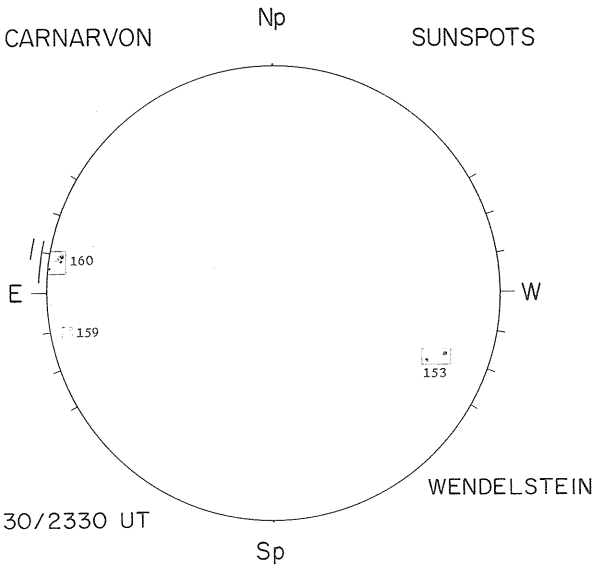
CALCIUM REPORT

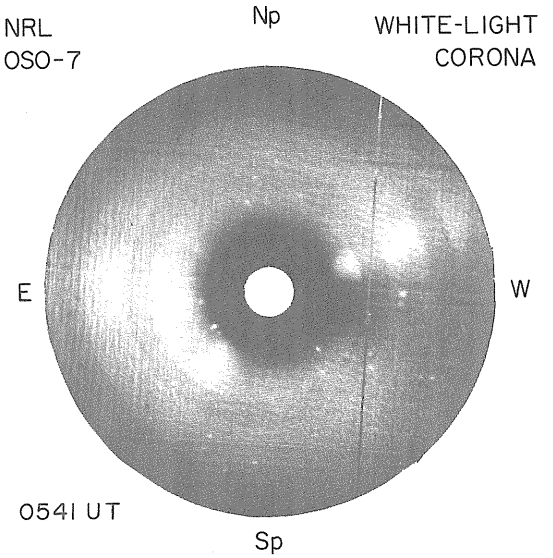


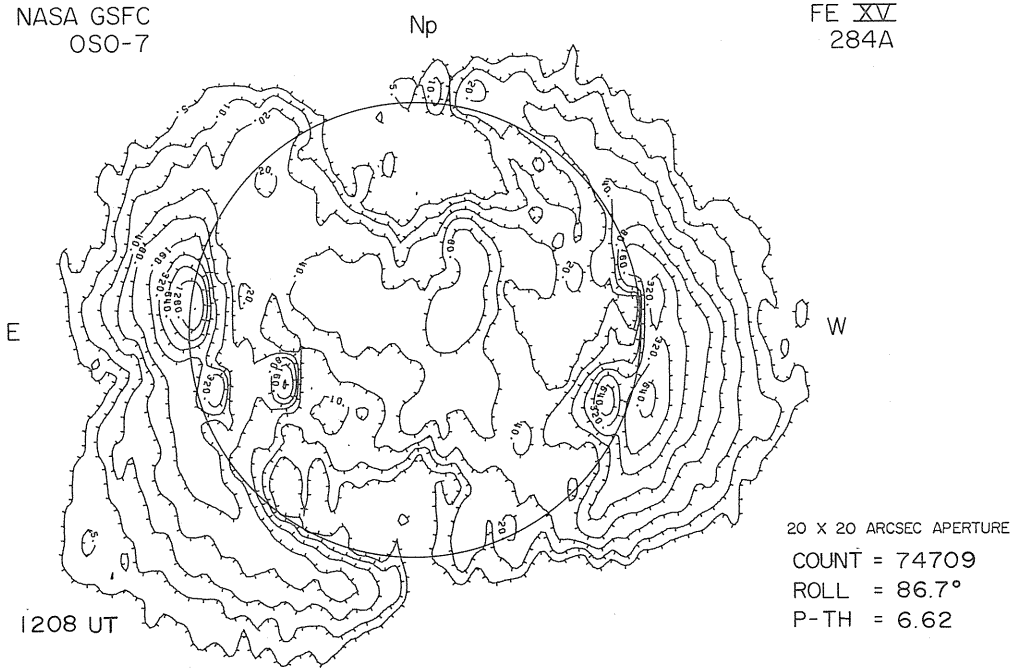
FAIR	M
53-1100	-2.5
58-0300	-2.5
59-0800	-2.5
60-3000	-3.5

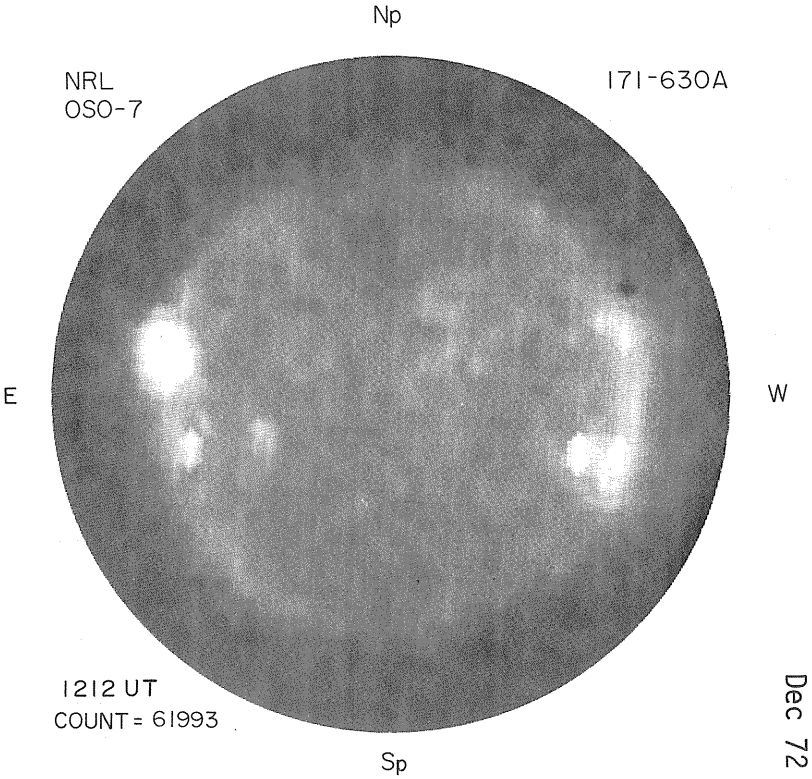
1530 UT


BOULDER
31
Np
Hα
E
W
1919 UT
Sp


CARNARVON
Np
SUNSPOTS
160
E
W
159
153
WENDELSTEIN
30/2330 UT
Sp


NRL
OSO-7
Np
WHITE-LIGHT
CORONA
E
W
0541 UT
Sp


NASA GSFC
OSO-7
Np
FE XV
284A
E
W
1208 UT
20 X 20 ARCSEC APERTURE
COUNT = 74709
ROLL = 86.7°
P-TH = 6.62


Np
NRL
OSO-7
171-630A
E
W
1212 UT
COUNT = 61993
Sp

83
Dec 72

REGIONS OF SOLAR ACTIVITY

DECEMBER 1972

MCMATH REGION 12130 CMP DATE 2.8

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	11	29	12130	S20 E45	223	300	1.0										
72	11	30	12130	S20 E28	226	200	1.0										

MCMATH REGION 12127 CMP DATE 2.8

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	11	28	12127	N17 E59	220	400	2.0										
72	11	29	12127	N17 E48	220	400	1.5										
72	11	30	12127	N17 E35	219	300	2.0	19055	N18 E34	216	(BF)	2					
72	12	1	12127	N17 E23	219	400	2.0										
72	12	3	12127	N18 W11	225	300	1.5										
72	12	6	12127	N18 W48	223	200	1.0										

MCMATH REGION 12128 CMP DATE 3.9

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	11	28	12128	N03 E70	209	800	2.0										
72	11	29	12128	N04 E58	210	1000	2.0									3	2
72	11	30	12128	N04 E43	211	800	2.0										
72	12	1	12128	N04 E29	213	1000	2.0										
72	12	2														2	1
72	12	3	12128	N04 E03	211	700	2.0										
72	12	6	12128	N04 W36	211	800	2.0										
72	12	7	12128	N04 W50	211	900	2.0										

MCMATH REGION 12132 CMP DATE 4.0

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	2						19056	S15 E14	209	(B)	2					
72	12	3	12132	S14 E05	209	500	2.5	19056	S16 E04	210	(B)	1	10	10	BXO	2	1
72	12	4							S16 W06				-0	5	BXX		
72	12								S16 W06				-0	5	BXX		
72	12	5						19056	S16 W28	212	(BP)	3				4	2
72	12	6	12132	S15 W36	211	700	3.0	19056	S15 W42	216	(AP)	2	40	5	CAO	2	1
72	12	7	12132	S15 W49	210	900	2.5		S15 W51				20	1	HSX	3	2
72	12								S15 W51				20	1	HSX		
72	12	8														3	2

MCMATH REGION 12135 CMP DATE 6.2

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	6	12135	N06 W06	181	300	1.5										
72	12	7	12135	N06 W19	180	400	1.0										

MCMATH REGION 12134 CMP DATE 7.0

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	3	12134	N16 E45	169	200	1.0										

MCMATH REGION 12133 CMP DATE 8.1

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	3	12133	N11 E59	155	200	1.0										
72	12	5														4	2

REGIONS OF SOLAR ACTIVITY

DECEMBER 1972

MCMATH REGION 12136 CMP DATE 11.9

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	6	12136	N13 E71	104	1800	3.5
72	12	7	12136	N13 E59	102	3100	3.5
72	12						
72	12	8					
72	12	9					
72	12						
72	12	10					
72	12	11	12136	N12 E04	106	3200	3.5
72	12						
72	12	12					
72	12						
72	12	13					
72	12						
72	12	14					
72	12						
72	12	15					
72	12						
72	12	16					
72	12						
72	12	17	12136	N12 W75	105	2900	3.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
19057	N11 E68	106	(BF)	2	50	6	CAO	7	4
	N12 E63				160	18	DAI	17	10
	N12 E63				160	18	DAI		
	N11 E41				540	31	EAI	4	3
19058	N11 E25	107	(B)	4					
19057	N11 E30	102	(BP)	5	750	22	EKC		
	N12 E16				490	37	EKI	9	5
19058	N11 W04	111	(BP)	4				24	14
19057	N10 E04	103	(BP)	5	380	36	FAI		
19058	N11 W17	110	(B)	3	320	24	FAI	18	10
19057	N10 W10	103	(BP)	5					
19058	N12 W34	112	(BP)	4				13	8
19057	N11 W25	103	(BP)	5	160	8	DAO		
19058	N12 W44	113	(BP)	5	100	5	ESO	12	7
19057	N11 W34	103	(BP)	4	80	7	CAO		
19058	N12 W58	112	(BP)	4				10	6
19057	N10 W51	105	(AP)	4	180	6	EAO		
19058	N13 W69	112	(B)	3	120	4	EAO	7	4
19057	N11 W64	107	(AP)	4					
19057	N12 W80	106	AP	0	10	1	HSX	6	3

MCMATH REGION 12137 CMP DATE 12.5

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	9					
72	12						
72	12	10					
72	12						
72	12	11	12137	S14 E12	98	900	2.5
72	12						
72	12	12					
72	12	13					
72	12	14					
72	12	15					
72	12	16					
72	12	17	12137	S15 W67	97	1100	2.5
72	12	18	12137	S16 W80	94	900	1.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
19059	S17 E32	100	(AP)	1					
19060	S11 E33	99	(BP)	2					
	S08 E23				10	5	BXO		
	S14 E21				-0	1	AXX		
19059	S19 E09	98	(B)	2	10	5	CRO		
	S10 E14				-0	1	AXX		
19059	S19 W05	98	(BP)	2	-0	6	BXO		
19059	S18 W19	97	(BP)	3	60	8	CAI		
19059	S17 W28	97	(BP)	3	20	4	CAO		
19059	S17 W43	97	(B)	2	20	7	CAO		
19059	S18 W55	98	(BP)	2	10	1	HRX		
								4	3

MCMATH REGION 12141 CMP DATE 15.6

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	11	12141	N23 E57	53	500	3.5
72	12	12					
72	12	13					
72	12	14					
72	12	15					
72	12	16					
72	12	17	12141	N23 W26	56	700	2.5
72	12	18	12141	N24 W41	55	800	2.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
19062	N21 E51	56	(AP)	2					
19062	N20 E39	54	(BF)	3	-0	5	BXO		
19062	N20 E23	55	(BP)	2	-0	4	BXI		
19062	N20 E14	55	(BP)	3	10	5	CRI		
19062	N21 W01	55	(BP)	3	10	2	CRO		
19062	N21 W16	59	(BP	3	10	1	HRX		

MCMATH REGION 12138 CMP DATE 15.7

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	11	12138	S11 E54	56	1800	1.5
72	12	14					
72	12						
72	12	15					
72	12						
72	12	16					
72	12						
72	12	17	12138	S11 W25	55	1400	2.5
72	12	18	12138	S10 W41	55	1100	2.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
19063	S09 E06	63	A	0					
19064	S11 E13	56		0					
19063	S10 W06	60	(AP)	2					
19064	S12 E01	53	(AP)	2					
19063	S10 W19	62	AP	0					
19064	S13 W12	55	(AP)	2	-0	1	AXX		

Note: When there is only one side of the parenthesis around the magnetic type of sunspot it means that only half of the sunspot group was measured. The parenthesis is on whichever half was measured, either the leader or the follower.

REGIONS OF SOLAR ACTIVITY

DECEMBER 1972

MCMATH REGION 12139 CMP DATE 15.7

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	11	12139	S18 E52	58	700	3.5
72	12	12					
72	12	13					
72	12	14					
72	12	15					
72	12						
72	12	16					
72	12	17	12139	S18 W25	55	1700	3.0
72	12	18	12139	S17 W40	54	1500	3.0
72	12	19					
72	12	20					
72	12	21					
72	12	22					

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
19061	S20 E48	59	(BP)	3	20	4	CSO	14	8
19061	S20 E34	59	(BP)	4	390	22	DAI	22	13
19061	S20 E19	59	(BP)	5	400	16	DAI	18	10
19061	S20 E09	60	(BP)	5	370	26	EKI	22	13
19061	S20 W04	58	(BP)	5	350	19	EKI	26	15
19066	S15 W01	55	(BP)	1					
19061	S20 W16	59	(BP)	4	300	15	EKI	18	10
19061	S20 W32	58	BP	0	320	10	EAO	18	11
19061	S20 W41	57	(BP)	6				18	11
19061	S20 W54	57	(BP)	5	120	5	CSI	15	9
19061	S20 W75	66	(AP)	4	130	1	HSX	12	7
	S16 W82				120	1	HSX	7	4
								6	3

MCMATH REGION 12140 CMP DATE 16.5 RETURN OF REGION 12114 ROTATION 3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	11	12140	S16 E65	45	900	2.0
72	12	17	12140	S16 W14	44	700	1.5
72	12	18	12140	S17 W28	42	500	1.5

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX

MCMATH REGION 12143 CMP DATE 18.8

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	11	12143				
72	12	12					
72	12	13					
72	12	14					
72	12	15					
72	12	16					
72	12	17	12143	S06 E15	15	2200	3.5
72	12	18	12143	S06 E00	14	1800	3.5
72	12	19					
72	12	24					

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
								5	3
								8	4
								10	6
19065	S05 E55	14	(A)	1				12	7
19065	S04 E40	14	(AF)	1	-0	1	AXX	4	3
19065	S07 E30	13	(AF)	1				5	3
	S06 E10				10	1	BXO	12	7
19065	S07 W01	17	BF	0				12	7
	S08 W17				20	2	BXO	6	3
								3	2

MCMATH REGION 12142 CMP DATE 19.3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	17	12142	N18 E23	7	200	1.5
72	12	18	12142	N18 E06	8	200	1.5

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX

MCMATH REGION 12148 CMP DATE 19.5

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	18	12148	S12 E09	5	100	2.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX

MCMATH REGION 12144 CMP DATE 20.5 RETURN OF REGION 12116 ROTATION 2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
72	12	15					
72	12	16					
72	12	17	12144	S06 E37	354	800	3.0
72	12	18	12144	S07 E22	353	500	3.0
72	12	19					
72	12	20					
72	12	21					

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
19067	S07 E64	351	(BP)	2					
19067	S08 E51	353	(B)	1					
19067	S08 E34	353	B	0	50	6	CRO		
19067	S08 E21	356	(BP	3	50	7	BXO	8	5
19067	S08 E12	352	(B)	3	30	4	DAO		
	S07 W01				30	4	CRO		
19067	S10 W14	351	AP	0	10	3	AXX		

REGIONS OF SOLAR ACTIVITY

DECEMBER 1972

MCMATH REGION 12145 CMP DATE 21.5 RETURN OF REGION 12124 ROTATION 2

CALCIUM PLAGE DATA / SUNSPOT DATA 9.1 CM

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	17	12145	N17 E52	339	600	3.0	19068	N15 E46	341	B	0	50	5	CRO		
72	12	18	12145	N16 E34	341	800	3.0	19068	N16 E35	342	(B)	4				8	5
72	12	19						19068	N16 E21	343	(B)	5	30	9	BXO	12	7
72	12	20						19068	N17 E06	345	(BP)	4	140	12	DAO	10	6
72	12	21						19068	N17 W06	343	(B)	5	130	9	DAO	8	4
72	12	22						19068	N17 W22	342	B	0	130	13	BSO	8	5
72	12	23						19068	N18 W31	341	(B)	5	120	4	DSO		
72	12	24						19068	N18 W49	343	BP	0	100	7	DSO	6	4
72	12	25						19068	N17 W61	344	BP	0	60	1	HRX	8	4
72	12	26						19068	N16 W76	347	(AP)	2	30	1	HSX		
72	12	27	12145	N17 W82	339	1100	2.5										

MCMATH REGION 12146 CMP DATE 22.3 RETURN OF REGION 12118* ROTATION 4

CALCIUM PLAGE DATA / SUNSPOT DATA 9.1 CM

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	17	12146	S10 E63	328	700	1.0										
72	12	18	12146	S10 E45	330	800	1.5										
72	12	21						19070	S11 E10	327	(BP	3					
72	12	23						19072	S18 W16	326	(A)	2					
72	12	26						19074	S13 W56	327	(AP)	2				4	2
72	12	27	12146	S12 W71	328	800	3.0	19074	S14 W73	329	(B)	3	-0	2	BXO	5	3
72	12	28						19074	S14 W88	332	A	0	10	1	AXX	5	3

MCMATH REGION 12147 CMP DATE 23.6

CALCIUM PLAGE DATA / SUNSPOT DATA 9.1 CM

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	17	12147	N02 E83	308	900	1.0										
72	12	18	12147	N01 E65	310	800	2.0										
72	12	24														3	2
72	12	25														3	2
72	12	26														2	1
72	12	27	12147	N01 W54	311	500	1.5										
72	12	29														4	2

MCMATH REGION 12149 CMP DATE 23.7

CALCIUM PLAGE DATA / SUNSPOT DATA 9.1 CM

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	17														7	4
72	12	18	12149	N17 E62	313	300	2.0	19069	N17 E64	313	(AF)	2				9	5
72	12	19						19069	N17 E50	314	BF)	2					
72	12	20						19069	N17 E37	314	BF	0	20	4	BXO	5	3
72	12	21						19069	N11 E30	307	(BF)	5	120	16	DAI	19	11
72	12								N16 E30				20	3	BXO		
72	12	22						19069	N11 E14	306	BF	0	240	33	DSI	15	9
72	12								N18 E14				-0	1	AXX		
72	12	23						19069	N11 E01	309	(BP)	5	300	19	EAO		
72	12	24						19069	N11 W15	309	B	0	200	29	EAO	15	9
72	12	25						19073	N16 W35	318	AP	0	10	1	AXX	16	10
72	12							19069	N11 W26	309	BP	0	350	17	EKI		
72	12	26						19073	N16 W46	317	(BP)	2	10	1	AXX	15	9
72	12							19069	N12 W40	311	(BP)	5	280	28	EAI		
72	12	27	12149	N15 W53	310	2300	3.5	19069	N11 W55	311	(D)	5	100	10	EKI	20	12
72	12	28						19069	N11 W70	314		0	240	5	EAI	15	9
72	12	29						19069	N11 W86	315		0	210	2	DSO		

MCMATH REGION 12150 CMP DATE 24.5 RETURN OF REGION 12118* ROTATION 4

CALCIUM PLAGE DATA / SUNSPOT DATA 9.1 CM

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT	FLUX
72	12	18	12150	S17 E66	309	800	1.0										
72	12	19														9	5
72	12	20														6	4

(cont'd)

*An asterisk beside the "Return of Region" number indicates that the new region is only part of the area of the old region.

REGIONS OF SOLAR ACTIVITY

DECEMBER 1972

(cont'd)

72	12	21															5	3
72	12	22															4	3
72	12	24															3	2
72	12	25															4	2
72	12	26															3	2
72	12	27	12150	S18 W42	299	600	1.0											
72	12	30									S17 W71			40	4	DRO	4	3

MCMATH REGION 12151 CMP DATE 25.9 RETURN OF REGION 12126 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
72	12	27	12151	S12 W24	281	700	1.5	19075	S12 W28	284	(AP)	2					3	2
72	12	28															2	1
72	12	31	12151	S13 W80	285	200	1.0										4	2

MCMATH REGION 12152 CMP DATE 26.3

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
72	12	20							N10 E79				20	3	BXO			
72	12	21						19071	N19 E60	277	(B)	4	10	5	BXO			
72	12	27	12152	N20 W19	276	300	1.5											
72	12	31	12152	N18 W70	275	500	1.5											

MCMATH REGION 12156 CMP DATE 27.4

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
72	12	31	12156	S01 W56	261	100	1.0											

MCMATH REGION 12153 CMP DATE 27.5 RETURN OF REGION 12125 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
72	12	27	12153	S13 W03	260	300	2.0											
72	12	28						19076	S15 W19	263	A	0						
72	12	29						19076	S16 W33	262	(BP)	3	60	5	DAO		5	3
72	12	30						19076	S16 W45	264	(BP)	4					4	2
72	12	31	12153	S15 W55	260	1100	2.5	19076	S15 W65	266	(BP	3	-0	5	CAO			
73	1	1	12153	S17 W70	260	900	3.0		S15 W70				10	1	HRX		4	2
73	1	2	12153	S16 W82	258	1100	2.0										3	2

MCMATH REGION 12157 CMP DATE 28.9

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
72	12	31	12157	N16 W36	241	100	1.5											
73	1	1	12157	N15 W50	240	100	1.5											

MCMATH REGION 12161 CMP DATE 30.0

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
73	1	1	12161	N36 W37	227	100	1.5											
73	1	2	12161	N09 W50	226	200	1.0											
73	1	3	12161	N08 W59	225	200	1.0											

MCMATH REGION 12154 CMP DATE 30.5

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM	
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA	CNT	C	INT FLUX		
72	12	27	12154	N17 E37	220	400	1.5											
72	12	31	12154	N17 W15	220	400	1.5											

REGIONS OF SOLAR ACTIVITY

DECEMBER 1972

MCMATH REGION 12155 CMP DATE 31.3 RETURN OF REGION 12128 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA CNT	C	INT FLUX	
72	12	27	12155	N03 E48	209	200	2.0									
72	12	31	12155	N03 W05	210	100	2.0									
73	1	1	12155	N03 W21	211	100	2.0									
73	1	2	12155	N03 W38	214	300	2.0									
73	1	3	12155	N02 W50	216	300	1.5									
73	1	5	12155	N03 W78	217	200	1.0									

MCMATH REGION 12167 CMP DATE 31.4

CALCIUM PLAGE DATA								SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	AREA CNT	C	INT FLUX	
73	1	3	12167	S18 W42	208	200	1.5									

Note: Because of extremely bad weather conditions at McMath-Hulbert during the month of December, some of the region identifications may be subject to error, and some short-lived regions may have been missed.
No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on December 2, 4, 5, 8-10, 12-16, 19-26 and 28-30, 1972.
No sunspot observations were made at Mt. Wilson Observatory on December 4, 7 and 8, 1972.

DAILY CALCIUM PLAGE INDEX

DECEMBER 1972

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
72	12	1	11.7	72	12	11	17.5	72	12	21	*
72	12	2	*	72	12	12	*	72	12	22	*
72	12	3	6.8	72	12	13	*	72	12	23	*
72	12	4	*	72	12	14	*	72	12	24	*
72	12	5	*	72	12	15	*	72	12	25	*
72	12	6	5.5	72	12	16	*	72	12	26	*
72	12	7	8.1	72	12	17	23.7	72	12	27	9.0
72	12	8	*	72	12	18	18.7	72	12	28	*
72	12	9	*	72	12	19	*	72	12	29	*
72	12	10	*	72	12	20	*	72	12	30	*
								72	12	31	8.0

* NO OBSERVATIONS

SOLAR X-RAYS MEASURED BY SATELLITE
SOLRAD 10 – EXPLORER 44

DECEMBER 1972

NAVAL RESEARCH LABORATORY 1 - 8A HOURLY AVERAGES (10^{-3} ergs/cm^2/sec)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0.03	0.03	0.04	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.05	0.04	0.04	0.03	0.04	0.04
2	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.09	0.09	0.06	0.07	0.06	0.05	0.04	0.05	0.05	0.05	0.05	0.10	0.06	0.05	0.07
3	0.05	0.04	0.06	0.05	0.04	0.05	0.05	0.06	0.05	0.04	0.06	0.05	0.05	0.04	0.04	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05
4	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.06	0.04	0.05	0.05	0.05	0.06	0.11	0.13	0.23	0.16	0.21	0.27
5	0.22	0.15	0.11	0.08	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.06	0.07	0.06	0.05	0.04	0.06	0.05
6	0.05	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.05	0.04	0.05	0.14	0.09	0.10	0.05	0.05	0.05	0.04	0.06	0.05	0.06	0.07	0.11	0.15
7	0.13	0.19	0.20	0.20	0.32	0.35	0.52	1.07	0.25	0.31	0.27	0.24	0.21	0.19	0.19	0.16	0.15	0.13	0.14	0.13	0.11	0.12	0.13	0.12
8	0.13	0.12	1.06	0.80	0.19	0.15	0.16	0.16	0.14	0.19	0.19	0.17	1.09	0.61	0.18	0.11	0.14	0.13	0.28	0.33	0.16	0.28	0.22	11.6
9	1.94	0.55	0.25	0.23	0.20	0.18	0.17	0.15	0.13	0.11	0.12	0.12	0.13	0.14	0.13	0.21	7.08	2.66	0.64	0.37	0.33	0.18	0.19	0.22
10	14.1	21.0	2.11	1.19	0.79	0.40	0.63	0.29	0.24	0.23	0.19	0.19	0.17	0.15	0.15	0.17	0.24	0.32	0.85	0.51	0.57	0.35	0.44	0.23
11	0.20	0.20	0.23	0.21	0.20	0.31	0.20	0.31	0.26<	0.39<	0.38<	0.64	0.50	0.38	0.46	0.50	0.32	0.60	0.54	0.65	0.82	0.32	0.34	0.35
12	0.62	1.15	0.97	0.37	0.31	0.61	0.67	1.25	0.38	0.36	0.32	0.64	1.05	0.79	0.83	1.39	0.66	0.68	1.44	0.61	0.80	0.79	0.67	0.64
13	0.58	0.58	0.52	0.88	0.78	0.57	0.49	0.57	0.87	0.71	1.19	0.53	1.02	0.57	0.33	0.30	0.51	1.55	1.16	0.55	0.55	0.62	0.36	1.38
14	0.61	0.26	0.34	0.27	0.29	0.25	0.45	0.36	0.55	0.26	0.23	0.22	2.21	2.51	0.96	0.91	0.64	0.31	0.31	0.31	0.28	0.27	0.30	0.29
15	0.21	0.21	0.31	0.58	0.26	5.64	15.0	2.57	1.89	0.87	0.60	0.50	0.34	0.40	0.32	0.40	0.37	0.23	0.28	0.26	0.30	0.29	0.26	0.29
16	0.27	0.29	0.35	0.26	53.4	4.70<	1.21<	0.52	3.60	0.36	0.22	0.24	0.22	0.33	0.30	0.19	0.15	0.18	0.18	0.14	0.17	0.20	0.15	0.30
17	0.92	0.27	0.18	0.23	0.21	0.24	0.22	0.27	1.58	0.64	1.20	0.66	0.31	0.26	0.25	0.25	1.21	0.35	0.30	0.25	0.52	1.25	1.27	1.29
18	1.16	0.67	0.50	0.79	0.83	0.94	3.68	9.59	1.60	0.78	0.34	0.25	0.50	0.26	0.23	0.26	0.31	0.27	0.23	0.23	0.38	1.16	0.32	0.29
19	0.26	0.23	0.24	0.25	0.23	0.22	0.38	0.34	0.29	0.22	0.28	0.22	0.30	0.28	0.34	0.26	0.24	0.21	0.23	0.28	1.00	0.20	0.19	0.17
20	0.18	0.23	0.21	0.16	0.15	0.15	0.14	0.16	0.27	0.15	0.14	0.14	0.15	0.14	0.15	0.15	0.25<	0.24<	0.20<	0.21<	0.25<	0.18<	0.24<	0.19<
21	0.22<	0.20	0.21	0.20	0.22	0.45	0.26	0.23	0.27	0.31	0.31	0.42	0.58	0.43	0.32	0.92	0.67	0.49	0.32	0.48	0.40	0.31	0.28	0.66
22	0.60	0.47	0.24	0.33	0.22	0.30	1.16	2.07	0.94	0.70	0.22	0.54	0.20	0.34	1.07	0.57	1.30	0.36	0.29	0.30	0.29	0.22	0.26	0.18
23	0.55	0.48	0.15	0.15	0.24	1.81	0.40	0.23	0.28	0.26	0.19	0.25	0.20	0.34	0.24	0.26	0.19	0.16	0.13	0.12	0.13	0.15	0.14	0.18
24	0.19	0.12	0.13	0.12	0.14	0.11	0.11	0.21	0.17	0.17	0.12	0.10	0.12	0.11	0.10	0.12	0.12	0.12	0.15	0.22	0.24	0.63	2.15	0.83
25	1.03	0.50	1.03	1.26	0.65	0.20	0.24	0.42	0.62	0.45	0.28	0.21	0.31	0.28	0.15	0.19	0.13	0.16	0.16	0.16	0.18	0.21	0.24	0.23
26	0.20	0.16	0.20	0.18	0.20	0.24	0.17	0.15	0.14	0.14	0.12	0.14	0.13	0.12	0.11	0.11	0.30	0.31	0.30	0.15	0.13	0.11	0.11	0.15
27	0.84	0.66	0.20	0.18	0.15	0.19	0.19	0.21	0.32	0.20	0.20	0.22	0.35<	0.26<	0.16	0.13	0.14	0.13	0.15	0.17	0.17	0.23	0.15	0.16
28	0.16	0.28	0.14	0.13	0.16	0.15	0.16	0.14	0.20	0.12	0.15	0.15	0.16	0.18	0.17	0.15	0.18	0.16	0.16	0.14	0.16	0.19	0.72	0.43
29	0.22	0.28	0.26	0.28	0.25	0.30	0.28	0.26	0.28	0.42	0.31	0.32	0.33	0.49	0.69	1.01	0.45	0.64	0.59	0.52	0.68	1.29	1.07	0.62
30	1.30	0.86	0.53	0.55	0.68	1.13	0.74	0.47	3.20	0.96	0.31	0.37	0.54	0.27	1.10	1.24	0.31	0.32	0.48	0.41	0.29	0.29	0.29	0.32
31	0.53	0.63	4.64	0.70	2.91	1.96	0.97	0.95	0.30	0.22	0.32	0.22	0.18	0.29	0.18	0.20	0.15	0.17	0.18	0.22	0.22	0.21	0.20	0.18

VALUES MARKED WITH (<) WERE CALCULATED FROM DATA PROVIDED BY SOLRAD 9

SOLAR X-RAYS MEASURED BY SATELLITE
SOLRAD 10 – EXPLORER 44

DECEMBER 1972

NAVAL RESEARCH LABORATORY 8 - 20A HOURLY AVERAGES (10^{-2} ergs/cm^2/sec)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0,57	0.59	0,51	0,52	0,49	0.48	0,48	0,46	0,45	0.46	0.45	0,45	0.45	0,45	0,46	0.45	0,46	0.46	0,45	0.51	0.45	0.57	0.55	0.46
2	0,46	0.46	0,43	0.43	0.45	0,42	0,45	0,39	0,40	0.53	0.55	0,46	0,49	0,47	0,46	0.46	0,46	0.46	0,45	0.53	0.65	0.48	0.56	0.47
3	0,43	0.41	0,45	0,45	0.41	0.41	0,41	0,46	0,41	0.39	0.41	0,39	0,40	0.39	0,38	0.39	0,39	0.40	0,44	0.43	0,51	0.35	0.45	0.34
4	0,33	0.33	0,33	0,33	0,33	0.33	0,33	0,33	0,33	0.33	0.33	0,33	0,35	0.33	0,33	0.33	0,33	0.36	0,53	0.48	0.80	0,67	0.65	0.80
5	0,70	0.59	0,47	0,39	0,35	0.33	0.33	0,33	0,33	0.33	0,34	0,37	0,36	0,33	0,33	0.34	0,33	0.35	0,47	0.33	0,57	0.37	0.34	0.33
6	0,33	0.33	0,33	0.33	0,32	0,32	0,32	0,32	0,33	0.33	0.33	0,45	0,40	0,39	0,33	0.32	0,34	0.32	0,54	0.45	0,34	0,45	0.46	0,57
7	0,52	0.61	0,60	0.67	0,86	0,89	1,07	1,73	0,76	0.86	0,82	0,75	0,73	0,72	0,67	0.62	0,69	0.70	0,72	0.77	0,56	0,67	0.59	0.58
8	0,60	0.59	1,58	1,27	0,74	0.70	0,70	0,66	0,67	0.76	0,75	0,75	1,55	1.32	0,80	0.59	0,64	0.77	0,84	1.26	0.77	0.81	0.84	10.9
9	3,67	1.44	0,99	0,97	0,90	0.85	0,85	0,77	0.71	0.62	0,66	0,65	0,70	0,71	0,73	0.88	6,02	4.56	1,55	1.77	1.18	0.88	0.87	0.92
10	5,85	12.7	3,59	2.62	1,60	1.24	1,42	1,03	0,98	0.93	0,87	0,87	0,85	0.83	0,81	0.88	0,93	1.45	1,93	1.57	1.32	1.18	1.24	0.98
11	0,91	0,90	0,99	0,94	0,90	1.08	0,90	1,10				1,55	1,39	1,28	1,33	1.42	1,57	1.51	1,93	1.87	2,15	1.29	1.32	1.41
12	1,98	2.76	3,14	1.46	1,35	1.63	1,78	2,51	1.44	1.41	1.36	1,74	2,72	2.59	2,74	2.96	1,81	1.61	3,13	1.75	1.92	1.87	1.78	1.68
13	1,84	1.62	1,55	2,18	1,72	1.51	1,49	1,46	1,88	1.78	2.96	1,58	2,68	1,92	1.36	1.31	1,74	3.43	3,33	1.60	1.48	1.56	1.42	2.37
14	1,83	1.24	1,34	1,23	1,26	1.22	1,45	1,40	1,52	1.26	1.22	1,13	3,21	4,80	2,52	2.87	2,10	1.61	1,46	1.24	1.24	1.26	1.29	1.33
15	1,13	1.08	1,20	1,48	1,21	5,18	13,6	5,38	4,38	2.68	1.63	1,58	1,36	1.44	1,62	1.80	1,40	1.34	1,25	1.26	1,25	1.27	1.25	1.23
16	1,22	1.25	1,26	1,17	20,5	4.12	2,96	1,43	2.03	1.33	1.12	1,17	1,14	1.41	1,43	1.24	0,95	1.06	0,99	0.98	0.94	1.02	0.98	1.17
17	2,58	1.26	1,01	1,13	1,12	1.12	1,10	1,19	3,86	1.86	2.33	1,84	1,33	1.31	1,17	1.47	2,41	1.71	1,30	1.24	1.44	3.15	2.96	3.09
18	3,05	2.85	1,68	2,11	2,59	2.94	4,73	10,5	4,44	2.61	1.46	1,26	1,38	1.36	1,21	1,51	1,56	1.33	1,25	1.22	1.38	2.96	1.44	1.55
19	1,25	1.16	1,18	1,19	1,13	1.11	1,37	1,31	1,27	1.12	1.23	1,10	1,17	1.29	1,56	1.19	1,20	1.08	1,16	1.25	1.88	1.11	1.03	1.11
20	1,00	1.11	1,05	0,95	0,91	0.87	0,85	0,91	1.01	0.86	0.86	0,87	0,92	0,97	1,07	0.86								
21		0.99	1,01	0,99	0,99	1.08	1,13	1,02	1,08	1.15	1.16	1,28	1,59	1.33	1,47	2.68	1,99	1.54	1,35	1.50	1.46	1.63	1.33	1.81
22	1,71	1.43	1,13	1,21	1,09	1.16	2,19	3,81	2,54	2.01	1.18	1,42	1,10	1.24	2,30	1.48	2,89	1.32	1,14	1.16	1.25	1.06	1.18	0.95
23	1,30	1.37	0,88	0,87	0,99	3.16	1.31	1,11	1,10	1.07	1.00	1,07	1,16	1.45	1,05	1,10	0,98	0.88	0,80	0.78	0,91	0.85	0.98	0.82
24	0,87	0.73	0,73	0,72	0,72	0.69	0,67	0,81	0,85	0.76	0.69	0,69	0,79	0,82	0,60	0.69	0,72	0.72	0,80	0.93	1.19	1.54	3.09	2.15
25	2,03	1.40	2,22	2.96	1,95	0.90	0,97	1,23	1,46	1.30	1.15	1,09	1,13	1.28	0,86	0.89	0,77	0.84	0,89	0.85	1.13	0.98	0.89	0.93
26	0,88	0.77	0,82	0,85	0,86	0.88	0,80	0,74	0,73	0.77	0,70	0,82	0,72	0,81	0,67	0.62	0,80	0.93	0,98	0.86	0.72	0.76	0.62	0.69
27	1,67	1.50	0,85	0,85	0,74	0,78	0,83	0,80	0,85	0.89	0,83	0,96			0,74	0.68	0,71	0.73	0,79	0.96	0,81	1.00	0.75	0.81
28	0,80	1.00	0,76	0,72	0,76	0.75	0,77	0,72	0,79	0.70	0,80	0,85	0,94	0,85	0,80	0.74	0,85	0.84	0,85	0.95	0,84	0.93	1.32	1.15
29	0,95	1.03	1,10	1,13	1,10	1.18	1,14	1,14	1,16	1.39	1.58	1,30	1,44	1,57	1,58	2.86	1,58	1.82	1,65	2.08	2,09	2.96	2.96	1.76
30	3,35	2.55	1,58	1,59	1,89	2.36	2,17	1,49	3,69	2.27	1.40	1,21	1,44	1.14	1,76	2.88	1,27	1.36	1,78	1.40	1,30	1.25	1.23	1.26
31	1,32	1.47	5,14	1,92	3,34	2.71	2,39	2,01	1,22	1.01	1.26	1,06	0,91	1.06	0,87	0.92	0,89	0.98	1,07	0.91	1.01	0.99	0.97	0.93

SOLAR X-RAYS BY SATELLITE
SOLRAD 10 - EXPLORER 44

DECEMBER 1972

NAVAL RESEARCH LABORATORY

OUTSTANDING EVENTS

DAY	START TIME	0.5-3A FLUX XE-5	PEAK TIME	1-8A FLUX XE-4	PEAK TIME	8-20A FLUX XE-3	PEAK TIME	END TIME	COMMENTS
8	2322E	62,40D	2322E	288,00D	2322E	222,00D	2322E	2358D	
9	1604	57,60	1608	144,00	1606	88,80	1607	1730D	MULTIPLE PEAKS
10	0043E	115,00	0055	288,00	0054	148,00	0059	0220	
14	1252	3,72	1252	32,20	1252	59,20	1258	1301	
15	0551E	57,60	0607	288,00	0611	178,00	0612	0731	
16	0402E	324,00D	0402E	1010,00D	0402E	414,00	0403	0459D	
18	0651	19,20	0658	144,00	0659	133,00	0710	0741D	
30	0800	28,80	0801	93,40	0802	88,80	0803	0804D	
31	0223	67,20	0228	144,00	0227	104,00	0232	0245	
31	0430	38,40	0433	144,00	0433	74,00	0433	0440D	
31	0547	24,00	0548	70,80	0549	59,20	0548	0557	

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1972

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
08	0244	0348	0253	1-	1				1				0253E	12136
08	2257	0218	2309	2	5	2			2	4	8		2300E	12136
09	1603	1815	1620	2	5	2		4	1		9		1600	12136
10	0029	0326	0106	2-	5	1			2	2	2		0033	12136
11	0502	0530	0505	1-	1				1				0501	12136
11	0850E	0902	0855	1-	1			1					0855E	12136
11	1145	1200	1151	1-	1			1					1146	12136
11	1202	1209	1206	1-	1			1					1201	12136
11	1723	1815	1731	2+	5			3	1	2	9		1722	12136
12	1809	1811	1810	1-	1							1	1805	12139
13	2342	0001	2347	1-	1				1				2341	12139
14	1520	1630	1526	1-	1				1				1518	12139
14	2251	2315	2259	1-	1				1				*	
15	0539	0755	0612	2-	3	1			2	1	2		0536E	12143
16	0341	0654	0354	2+	5	3	2		2		2		0346E	12136
16	0758	0929	0841	1-	1			2					*	
16	0936	1007	0953	1-	1			1					*	
16	2057	2150	2105	1-	5			2			5	1	2056	12139
18	0650	0750	0709	1	3				2				0645	12143
21	1420	1430	1425	1	1					1	1		1418	12145
23	0521	0602	0533	1-	1				1				0518	12149
24	2204	2217	2206	1-	5				2	1		1	2205	12149
25	0046	0119	0055	1-	1				1				0050	12149
25	1000	1012	1005	1-	1			1			1		0955	12142
26	1230	1300	1238	1	1					1	1		1226E	12149
26	2013	2015	2014	1-	1							1	2010	12149
30	1430	1630	1443	1	5	1		2	1		2		1438E	12160
30	1856	1946	1859	1-	1				1				1859	12160
31	0220	0406	0230	1	3	1			2	2	3		0225E	12160
31	0426	0538	0434	1+	5	1			2	3	5		0430E	12160
31	2038	2054	2039	1-	1				1	1			*	

STATIONS REPORTING FOR DECEMBER 1972

AAVSO (A1, A5, A17, A22, A23, A26, A29, A31, A32, A34) (SEA)
(A1, A19, A21, A28, A30, A31, A33, A35, A36, A37) (SES)
BAHRAIN (BH) (SWF)
BOULDER (BO) (SCNA, SEA)
CAPE RACE (LORAN-C) (CP) (LF-SPA, SES)
DARMSTADT (DA) (SWF)
ENKOPING (SW) (SWF, SPA)
GESASHI (LORAN-C) (GE) (LF-SPA, SES)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA)
HOKKAIDO (LORAN-C) (HO) (LF-SPA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
JUPITER (LORAN-C) (JP) (LP-SPA, SES)
KURE (LORAN-C) (KR) (LF-SPA, SES)
MANILA (MA) (SWF, SCNA, SPA)
MARCUS (LORAN-C) (MR) (LF-SPA, SES)
MCMATH (MC) (SWF, SCNA)
NANTUCKET (LORAN-C) (NT) (LF-SPA, SES)
NEUSTRELITZ (NU) (SWF)
NEW DELHI (ND) (SWF, SCNA, SES)
PANSKA VES (PU) (SWF, SEA)
POITIERS (PO) (SEA)
PORT CLARENCE (LORAN-C) (PC) (LF-SPA, SES)
PRESTON (LO) (SEA)
SANDUR (LORAN-C) (SA) (LF-SPA, SES)
SAO PAULO (UM) (SPA, SES)
SITKINAK (LORAN-C) (SK) (LF-SPA, SES)
SOFIA (SF) (SES)
SYLT (LORAN-C) (ST) (LF-SPA, SES)
TABLE MOUNTAIN (TM) (SWF, SPA, LF-SPA)
TORINO (TN) (SPA)
TRINIDAD (TR) (SWF)
UPICE (UI) (SEA)
UPOLO POINT (LORAN-C) (UP) (LF-SPA, SES)
WHITE SANDS (WS) (SWF)
YAP (LORAN-C) (YP) (LF-SPA, SES)

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01	1355-1735 UM (17 kHz)
03	1615-1633 TM
05-08	1537-2020 TR
05	0130-1320 TM, 1010-1347 UM (16 kHz), 1900-1915 TM
07	1700-2105 UM (18 kHz), 1920-1930 TM, 2300-2320 TM
08	0012-0040 TM, 1400-1700 UM (17 kHz)
11	1547-1805 TR
12-31	0200-2400 A5
12	1252-1300 TR
13-14	0630-1200 TR
13	1500-1520 UM (18 kHz)
15-31	0000-2400 A32
15	1355-1710 UM (17 kHz)
16-31	0700-1730 A30
16	1450-1755 WS
19	1000-1320 Um (16 kHz)
21	2000-2400 MC, 2004-2350 UM (18 kHz)
22	0000-1214 MC, 1400-1715 UM (17 kHz), 1842-2227 TR
23-31	0500-2400 A28
23	0830-2400 WS
24	0000-0036 WS, 0920-1955 WS
25-31	0500-2400 A29
26	1437-1851 TR
27	1327-1339 TR
31	0000-2400 PO, 1652-1737 MC

SID's BY McMATH REGION

DECEMBER 1972

DAY	36	39	42	43	45	49	60	X-RAY	UN-KNOWN	NO FP
01										
02										
03										
04										
05										
06										
07										
08	2									
09	1									
10	1									
11	5									
12		1								
13		1								
14		1								1
15				1						
16	1	1								2
17										
18				1						
20										
21					1					
22										
23						1				
24						1				
25			1			1				
26						2				
27										
28										
29										
30							2			
31							2			1

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1972

DEC 1972	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
01	0000	0720	CULG							0425.5		1				IIIB
			CULG							0427.5	0428.5	1				IIIG
	0729	1502	WEIS													
	1146	2106	SGMR													
	1401	2334	HARV													
	1830	2400	BOUL													
	2022	2400	CULG				2206.5	2207	1	2206.5	2207	1				IIIG
02	0000	0721	CULG													
	0724	1503	WEIS													
	1143	2106	SGMR													
	1400	2400	BOUL													
	2023	2400	CULG													
	1400	2334	HARV				2324	2325	1							IIIG
03	0000	0721	CULG													
	0724	0852	WEIS													
	1015	1444	WEIS													
	1300	2106	SGMR													
	1400	2400	BOUL													
	1401	2334	HARV													
	2022	2400	CULG													
04	0000	0722	CULG													
	0738	1447	WEIS													
	1145	2105	SGMR													
	1400	2400	BOUL													
	2023	2400	CULG													
	1401	2334	HARV				2037	2039	2							IIIGG
05	0000	0722	CULG							0550.5	0557.5	1				II
	0737	1447	WEIS													
	1203	2105	SGMR													
	1400	2335	HARV													
	2000	2400	BOUL													
	2023	2400	CULG													
06	0000	0723	CULG													
	0739	0945	WEIS													
	1023	1449	WEIS													
	1205	2105	SGMR													
	1400	2400	BOUL													
	1401	2335	HARV													
	2024	2400	CULG													
07	0000	0723	CULG													
	0740	1450	WEIS													
	1205	2105	SGMR													
	1400	2335	HARV													
	1400	2400	BOUL													
			CULG							2025	2307.5	1				I
	2025	2400	CULG				2025	2400								IW
08	0000	0724	CULG				0000	0322	1	0224	0724	1				IS
			CULG							0034.5		1				IIIB
			CULG				0540	0724	1							IS
	0740	1451	WEIS													
	1206	2105	SGMR													
	1400	2335	HARV							1401	2257	1				IN
	1400	2400	BOUL							1545.7	1545.8	1				III
			BOUL							1618.8	1619.8	1				IIIG
			BOUL							1643.7	1644.0	1				IIIG
			BOUL							1716.6	1717.3	1				IIIG
			BOUL							1846.6	1846.7	1				III
			BOUL							1850.9	1851.0	1				III
			BOUL							1905.8	1905.9	1				III
			BOUL							1921.2	1921.4	1				III
			BOUL							1934.8	1934.9	1				III
	2024	2400	CULG				2024	2259	1	2024	2400	1				IS
			BOUL							2255.9	2305.5	3				IIIG
			HARV				2257	2326	3							IVP IIIGG
			CULG				2257	2400		2300	2400	2				IV
			CULG				2258	2301	2	2258	2311	3				II
			HARV				2258.8		1	2258.8	2305	3				II
			HARV							2300	2312	3				IV
			HARV							2300	2302	3	2300	2302	3	IIIGG
			CULG							2300	2304.5	3	2300	2302.5	3	IIIGG
			CULG										2302	2330	1	
			BOUL							2304.5	2325.5	1				IV
			HARV							2312	2326	3				IVP
			HARV				2327	2334	1	2326	2334	1				IVP
09			CULG				0000	0137	1	0000	0222	2				IV
	0000	0724	CULG							0000	0724	1				IS
			CULG							0514		1				IIIB
			CULG							0528		1				IIIB
	0743	0905	WEIS													
	1053	1446	WEIS													
	1401	2335	HARV							1404	2329	1				IN
			HARV				1601	1609	3	1601	1609	2				IVP IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1972

DEC 1972	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
09			HARV							1602	1603	3	1602	1603	3	IIIG
	1400	2400	BOUL							1602.3	1602.7	2				III
			BOUL							1605.6	1605.8	1				III
			HARV										1606	1612	2	IIIGG
			HARV							1607	1614	2				II
			BOUL							1607.0	1611.8	3				IIIGG
	1207	2105	SGMR										1607.3	1611.4	1	IIIG
			HARV				1611	1619	2							IIIGG
			BOUL							1612.5	1612.6	1				III
			BOUL							1612.8	1613.4	1				II
			BOUL							1622.8	1732.0	1				IS
			BOUL							1629.0	1704.2	1				CONT
			CULG							2025	2400	1				IS
	2025	2400	CULG				2025	2400								IS,W
			CULG							2028.5	2349	1				IIIN
			CULG							2206	2207	1				IIIG
			BOUL							2206.2	2206.6	2				III
10	0000	0724	CULG				0000	0336.5	1	0000	0724	1				IS
			CULG				0033.5	0035	1	0034.5	0036	2	0035	0036	1	IIIG
			CULG				0033.5	0103.5	1	0042	0104	1				IV
			CULG							0040.5	0042.5	1				IIIG
			CULG							0057.5	0106	1				IIIGG
			CULG							0218.5	0221.5	1				IIIG
			CULG							0336.5	0724	1				IIIN
	0744	1447	WEIS													
	1208	2105	SGMR										1321.9	1322.2	1	III
			SGMR										1354.7	1354.9	2	III
	1400	2400	BOUL							1629.7	1629.8	1				III
			BOUL							1709.4	1709.6	2				III
			BOUL							1814.5	1814.6	1				III
	1400	2336	HARV							1844	2331	1				IN
	2025	2400	CULG				2025	2400	1	2025	2400	1				IS
			CULG				2034	2035	1	2034	2035	1				IIIG
			HARV							2034	2035	3	2034	2035	3	IIIG
			BOUL							2035.0	2035.2	2				III
			CULG							2037.5	2257.5					IIIN,W
			BOUL							2158.7	2158.8	1				III
11	0000	0725	CULG				0000	0725		0000	0725					IW
			CULG							0213.5						IIIB,W
			CULG							0234		1				IIIB
			CULG							0527.5		1				IIIB
			CULG				0528	0528.5	1							FAST DRIFT
	0745	1449	WEIS													
	1209	2105	SGMR													
	1400	2400	BOUL													
	1401	2336	HARV				1658	1701	2	1658	1701	2				IIIGG
	2026	2400	CULG							2202		1				IIIB
12	0000	0709	CULG				0004.5	0115	1							I
			CULG				0008.5		1	0008.5		1				IIIB
			CULG				0043	0044	1	0043	0045	1				IIIGG
			CULG							0118.5	0120.5	1				IIIGG
			CULG							0122	0123	1				IIIG
			CULG							0128	0531.5	1				IIIN
			CULG							0312	0313	2	0312	0313	1	IIIG
			CULG							0317	0319	1				IIIG
			CULG							0320.5	0321.5	1				IIIG
			CULG							0358	0359.5	2	0358	0339	1	IIIG
			CULG							0402	0402.5	1				IIIG
			CULG							0420.5	0423	1				IIIG
			CULG				0457	0457.5	1	0456	0458	2				IIIG
	0746	1009	WEIS													
	1030	1449	WEIS													
	1209	2105	SGMR													
	1400	2336	HARV				1742	1743	3							IIIG
	1400	1700	BOUL							1905.6	1905.7	1				III
	2028	2400	CULG													
	2100	2400	BOUL							2238.8	2239.3	1				III
13	0000	0725	CULG							0100	0101.5	1				IIIGG
			CULG				0329.5	0331	1	0329.5	0333.5	2	0330	0332.5	1	IIIGG
			CULG							0720	0720.5					IIIG,W
			CULG							0722	0725	1				IIIGG,U
	0748	1447	WEIS							1122.5	1122.8	1				IIIB
			WEIS							1321.4	1321.6	1				IIIB
	1210	2105	SGMR										1340.9	1341.9	1	III
	1400	1600	BOUL													
	1400	2336	HARV				1657	1713	1							IN
	1900	2400	BOUL													
	2027	2400	CULG							2144	2144.5					IIIG,W
			CULG							2158.5						IIIB,W
14	0000	0726	CULG							0018	0022	1				IIIG
			CULG				0033.5	0034	1	0033.5	0036.5	1				IIIG
			CULG				0042.5	0301	1							IS
			CULG							0202.5	0205.5					IIIG,W
			CULG							0226		1				IIIB
			CULG							0240	0243	1				IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1972

DEC 1972	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
14			CULG							0352		1				IIIB
			CULG							0359.5	0403	1				IIIG
			CULG							0407	0409					IIIG,W
			CULG							0533	0533.5					IIIG,W
			CULG							0549.5						IIIB,W
			CULG							0554		1				IIIB
			CULG							0615.5	0617	1				IIIG
	0749	1447	WEIS							1331.5	1331.6	1				UNCLAS
	1400	2400	BOUL							1434.3	1435.0	1				III
	1401	2336	HARV							1555		3	1555		3	IIIG
			BOUL							1555.0	1555.4	2				IIIG
	1211	2105	SGMR										1555.0	1555.3	1	III
			BOUL							1712.3	1712.8	1				IIIG
			BOUL							1924.8	1924.9	1				III
	2027	2400	CULG				2159.5	2200	1	2159.5	2200.5	1				IIIG
			HARV				2252	2254	2	2253	2254	2				IIIG
			CULG				2253	2253.5	1	2253	2253.5	1				IIIG
15	0000	0727	CULG							0542.5	0546.5	1				IIIG,V
			CULG				0544		1	0544		1				IIIB
			CULG							0545	0620	1				II
	0749	1417	WEIS													
	1212	2105	SGMR													
	1400	1721	BOUL													
	1424	1448	WEIS													
	2028	2400	CULG				2028	2400								IS,W
			CULG							2038	2040	1				IIIG
	1416	2337	HARV				2057	2058	1	2057	2100	2				IIIGG,U
			CULG				2057.5	2059	1	2057.5	2059	1				IIIGG,U
	1945	2322	BOUL							2058.3	2058.6	1				III
			CULG				2059.5	2100	1	2059.5	2100	1				IIIG
			CULG							2107.5	2400					IIIS,W
			CULG							2115.5	2116	1				IIIG,U
16	0000	0727	CULG				0000	0727								IS,W
			CULG							0002	0546.5					IIIS,W
			CULG							0006.5	0007.5	1				IIIG
			CULG							0343	0410	2				II
			CULG				0343.5	0345.5	1	0344.5	0346	3	0344.5	0346	2	IIIG,V
			CULG										0345	0425	1	
			CULG				0346	0445	2	0346	0445	2				IV
			CULG							0348.5	0352.5	1	0349.5	0352	1	IIIG,RS
			CULG							0422	0423.5	1				UNCLF
			CULG							0430	0431	1				UNCLF
			CULG							0436.5	0437.5	1				UNCLF
	0749	1449	WEIS													
	1213	2106	SGMR													
	1417	2337	HARV							1648	2045	1				IN
			HARV							1827		3	1827		3	IIIG
	1400	2400	BOUL							1827.1	1827.3	1	1827.1	1827.3	1	III
			HARV							1833	1834	3	1833	1834	3	IIIG
			BOUL							1833.2	1833.5	1	1833.2	1833.5	1	III
			HARV				1909	2319	1							IN
			HARV							1917	1920	1	1918	1920	2	IIIGG
			BOUL							1919.3	1919.7	1	1919.3	1919.7	1	III
			HARV							1924	1927	1				IIIG
	2028	2400	CULG				2028	2400	1	2059	2400	1				IS
			HARV							2045	2333	1				I
			CULG							2203	2342.5	1				IIIN
			CULG							2234.5	2236	1				IIIGG
			HARV							2235	2236	2				IIIGG
			BOUL							2244.8	2245.7	1	2244.8	2245.7	1	III
17	0000	0728	CULG							0025	0649.5	1				IIIN
			CULG							0327	0328.5	1				IIIG
			CULG				0420	0510	1							IS
			CULG							0553	0555	1				IIIG
			CULG							0556	0558.5	2				IIIG,U
			CULG							0600	0602.5	1				IIIG
			CULG				0614.5	0616.5	1	0614.5	0617.5	1				I
			CULG				0700	0728	1							IS
			CULG							0726.5	0727.5	1				IIIG
	0752	1450	WEIS							1212.3	1214.9	2				IIIG
	1213	2106	SGMR													
	1416	2337	HARV							1416	1700	1				I
			HARV				1436	1843	1							IN
			HARV				1444	1445	1							IIIG,RS
			HARV							1700	1852	1				IN
			HARV				1949	2230	1	1943	2331	1				IN
	1400	2400	BOUL							1950.7	1950.8	1				III
	2029	2100	CULG				2029	2100	1							IS
	2112	2400	CULG				2112	2400	1							IS
			CULG				2154.5	2155	1							IIIG
			CULG							2213.5	2214.5	1				IIIG
			BOUL							2213.8	2213.9	1				III
			CULG				2257	2257.5	1	2257	2257.5	1				IIIG,U
			BOUL							2257.1	2257.3	1	2257.1	2257.3	1	III
			CULG							2332.5		1				IIIB
18	0000	0729	CULG				0000	0729	1							IS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1972

DEC 1972	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
18			CULG							0106.5	0107	1				IIIG
			CULG							0251.5		1				IIIB
			CULG				0313.5	0314	1							IIIG
			CULG							0323		1				IIIB
			CULG							0341.5	0342	1				IIIB
			CULG							0348	0349	1				IIIG
			CULG							0410.5	0414.5	2	0411.5	0412	2	IIIGG,V
			CULG							0425.5						IIIB,W
			CULG							0440	0441	2				IIIG,U
			CULG							0507						IIIB,W
			CULG							0511.5	0512					IIIG,W
			CULG							0514	0518	1				IIIGG
			CULG							0520.5	0522.5	2	0521	0522	1	IIIGG
			CULG							0531.5	0532.5	1				IIIG
			CULG							0558	0559	1				IIIG
			CULG				0614.5	0618	1							FAST DRIFT
			CULG							0645.5		1				IIIB
	1214	2107	SGMR													
	0752	1402	WEIS							1440.5	1440.6	1				III
	1405	1451	WEIS							1442.1	1442.2	1				UNCLAS
	1520	2337	HARV				1520	1835	1	1520	1835	1				I
			HARV							1615		3	1615		3	IIIB
	1400	2400	BOUL							1615.0	1615.4	1	1615.0	1615.4	1	III
			BOUL							1631.5	1631.8	2	1631.5	1631.8	2	III
			HARV							1632		3	1632		3	IIIB
	2030	2400	CULG							2114.5		1				IIIB
			BOUL							2114.8	2114.9	1	2114.8	2114.9	1	III
			BOUL							2117.8	2117.9	1	2117.8	2117.9	1	III
			CULG							2118		1				IIIB
			BOUL							2126.9	2130.0	1	2126.9	2130.0	1	III
			CULG							2129.5		1				IIIB
			CULG				2134	2400	1							IS
			BOUL										2139.6	2139.7	1	III
			HARV							2153	2154	2	2153	2154	2	IIIG
			CULG							2153	2154	2				IIIG
			BOUL							2153.2	2154.2	2	2153.2	2154.2	2	III
			HARV				2203	2328	1	2203	2331	1				IN
19	0000	0729	CULG				0045	0231								IS,W
			CULG							0216		1				IIIB
			CULG				0223	0223.5	1	0222.5	0224.5	2	0222.5	0224	1	IIIGG,V
			CULG				0225.5	0227	1	0225.5	0226.5	1	0225.5	0226.5	1	IIIGG
			CULG				0401									IIIB,W
			CULG				0424.5									IIIB,W
			CULG				0531	0532								IIIG,W
			CULG				0617.5									IIIB,W
			CULG				0649									IIIB,W
	0748	1452	WEIS													
	1215	2107	SGMR													
	1419	2338	HARV													
	1400	2400	BOUL										1737.5	1738.5	1	III
			BOUL							1816.1	1816.3	1				III
			BOUL										1904.4	1909.6	1	III
			BOUL										1918.1	1919.0	1	III
	2030	2400	CULG							2208		1				IIIB
			CULG							2302		1				IIIB
			BOUL							2302.1	2302.3	1	2302.1	2302.3	1	III
20	0000	0729	CULG							0024	0121	1				IS
			CULG							0031.5	0032.5					IIIG,W
			CULG							0036	0037					IIIG,W
			CULG							0421	0427					IN,W
			CULG				0637.5	0729								IW
	0749	1452	WEIS													
	1215	2107	SGMR													
	1400	1819	BOUL													
	1416	2340	HARV							1416	1850	1				IN
			HARV				1653	2300	1							IN
			HARV							1850	2122	1				I
	2031	2400	CULG				2031	2400	1	2031	2400	1				IS
			CULG							2033	2400					IIIS,W
	2100	2400	BOUL													
			HARV							2122	2340	2				I
21			CULG							0000	0024					IIIS,W
	0000	0730	CULG				0000	0200	1	0000	0730	1				IS
	0705	1320	WEIS													
	1216	2108	SGMR													
	1334	1454	WEIS													
	1417	2340	HARV				1418	2337	1	1417	2337	1				IN
	1400	2400	BOUL							1605.6	1605.7	1	1605.6	1605.7	1	III
			BOUL							1608.6	1608.7	1	1608.6	1608.7	1	III
			BOUL										1622.7	1622.9	1	III
			BOUL										1641.7	1641.3	1	III
			BOUL										1643.6	1643.8	1	III
			BOUL										1644.4	1644.6	1	III
			BOUL										1648.8	1649.7	1	III
			BOUL										1651.9	1652.2	1	III
	2031	2400	CULG				2031	2400	1	2031	2400	1				IS
			BOUL										2354.6	2354.8	1	III

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1972

DEC 1972	TIMES OF OBSERVATION		STATION	EVENTS													SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND				
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.		
22	0000	0730	CULG				0000	0730		0000	0200						IS,W
			CULG							0635	0638						IW
	1217	2109	SGMR														
	0753	1454	WEIS				1321.3	1321.6	1								IIIG
	1400	2400	BOUL														
	1416	2340	HARV							1416	2340	1					I
	2234	2400	CULG				2234	2400	1	2234	2400	1					IS
			CULG							2337.5							IIIB,W
23	0000	0731	CULG				0000	0731	1	0000	0731	1					IS
			CULG							0132.5	0133.5						IIIG,W
			CULG							0317							IIIB,W
			CULG							0353.5							IIIB,W
			CULG							0356							IIIB,W
			CULG							0456	0456.5	1					IIIG
			CULG							0556	0702						IIIN,W
			CULG							0705	0705.5	1					IIIG
	0753	1454	WEIS														
	1217	2109	SGMR														
	1417	2340	HARV							1418	2335	1					IN
	1400	2400	BOUL							1544.4	1545.0	1	1544.4	1545.0	1		IIIG
			BOUL							1545.0	1946.2	1	1545.0	1946.2	1		CONT
			HARV							1634	1958	1	1634	1958	1		IIIN
			HARV				1909	2339	1								IN
			BOUL										1957.2	1957.3	1		III
			BOUL							2002.2	2002.5	1	2002.2	2002.5	1		III
			BOUL										2003.8	2011.3	1		IIIGG
	2031	2400	CULG				2031	2200	1	2031	2140	1					IS
			CULG							2037	2400						IIIN,W
			BOUL										2042.7	2043.2	1		IIIG
			BOUL										2045.4	2045.9	1		IIIG
			BOUL							2106.9	2108.0	2	2106.9	2108.0	2		IIIG
			BOUL										2114.4	2117.3	1		IIIG
			BOUL							2132.4	2132.8	1	2132.4	2132.8	1		IIIG
			CULG				2200	2400									IW
			BOUL							2228.1	2228.3	2	2228.1	2228.3	2		III
			CULG				2334	2335.5	1								FAST DRIFT
			HARV				2339	2340	1								IIIGG
24	0000	0732	CULG				0000	0551									IN,W
			CULG							0000	0732						IIIN,W
			CULG							0431.5		1					IIIB
			CULG							0447	0600	1					IN
	0753	1245	WEIS														
	1216	2110	SGMR														
	1417	2341	HARV							1417	1946	1					IN
	1400	2400	BOUL							1456.4	1456.9	1	1456.4	1456.9	1		III
			BOUL							1528.0	2131.7	1	1528.0	2131.7	1		CONT
			HARV							1853	1952	1	1853	1952	1		IIIN
			HARV							1946	2208	1					I
	2032	2400	CULG				2032	2400	1	2032	2400	1					IS
			CULG							2032	2400						IIIS,W
			BOUL							2143.6	2145.1	1	2143.6	2145.1	1		IIIG
			HARV							2208	2341	1					IN
			BOUL							2209.0	2209.9	1	2209.0	2209.9	1		IIIG
			BOUL										2224.8	2225.2	1		IIIG
			BOUL							2239.5	2240.0	1	2239.5	2240.0	1		III
25	0000	0732	CULG				0000	0732	1	0000	0732						IS,W
			CULG							0000	0732						IIIN,W
			CULG				0420.5	0421	1								IIIG
			CULG				0602	0603	1	0602	0603	1					IIIG
	1123	1454	WEIS							1213.1	1213.2	1					IIIB
			WEIS							1221.4	1221.9	2					IIIG
			WEIS							1224.4	1244.5	1					III
	1416	2342	HARV							1417	1628	1					IN
			HARV				1454	2337	1								IN
	1400	2400	BOUL							1543.7	1544.9	1	1543.7	1544.9	1		IIIG
			HARV							1628	1656	1					I
			BOUL							1630.2	1631.5	2	1630.2	1631.5	2		III
			HARV							1640	1641	3	1640	1641	3		IIIG,V
	1217	2110	SGMR										1640.3	1641.1	1		III
			BOUL										1650.0	1910.0	1		CONT
			HARV							1656	2337	1					IN
			HARV							1711	1919	1	1711	1919	1		IIIN
			BOUL							1912.6	1912.8	1	1912.6	1912.8	1		III
			BOUL							1918.5	1918.1	1	1918.5	1918.1	1		III
			BOUL							2002.5	2002.7	1	2002.5	2002.7	1		III
	2032	2400	CULG				2032	2400	1	2032	2400	1					IS
			CULG							2045.5	2257						IIIN,W
			BOUL										2106.4	2106.7	1		III
			CULG							2145.5	2146	1					IIIG
			BOUL							2146.0	2146.2	1	2146.0	2146.2	1		III
			BOUL							2146.5	2159.2	1	2146.5	2159.2	1		IIIGG
			BOUL										2204.7	2205.1	1		IIIG
			BOUL							2220.9	2221.1	1	2220.9	2221.1	1		III
			BOUL										2257.9	2258.2	1		III
			CULG							2319	2320	1					UNCLF
			CULG							2321.5	2322	1					UNCLF
26	0000	0733	CULG				0000	0733	1	0000	0733	1					IN

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1972

DEC 1972	TIMES OF OBSERVATION		STATION	EVENTS													SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND				
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.		
26			CULG							0732	0733	1					IIIG,U
	0753	1455	WEIS							0847.5	0848.3	1					IIIG
	1218	2104	SGMR														
			WEIS							1311.8	1312.7	1					IIIG
			WEIS							1342.7	1343.6	1					IIIG
			WEIS							1349.3	1349.4	1					IIIB
	1417	2342	HARV							1417	1805	1					IN
			HARV							1614	1616	2	1614	1615	2		IIIG
	1430	2400	BOUL							1614.0	1619.2	2	1614.0	1619.2	2		IIIG
			HARV				1621	1624	1								I
			HARV				2015	2016	2								IIIGG
	2033	2400	CULG							2040.5							IIIB,W
			CULG							2058							IIIB,W
			CULG				2100	2400									IN,W
			HARV				2107	2131	1	2102	2133	1					IN
			CULG							2118		1					IIIB
27	0000	0733	CULG				0000	0733		0000	0100						IS,W
			CULG				0300.5		1	0300.5		1					IIIB
	1416	2343	HARV							1420	2337	1					IN
	0754		WEIS							1425.8	1426.1	2					IIIB
	1134	2120	SGMR										1426.0	1426.4	1		III
			HARV							1659	1702	2	1700	1701	2		IIIGG,V
	1430	2400	BOUL							1700.5	1701.7	2	1700.5	1701.7	2		III
	2033	2400	CULG							2033.5	2037.5	1					IIIGG
			CULG				2110	2400	1	2110	2400	1					IN
			CULG				2153	2153.5		2153	2153.5						IIIG,W
28	0000	0125	CULG				0000	0125	1	0000	0125	1					IN
			CULG							0118		1					IIIB
	0215	0734	CULG				0215	0734		0215	0734						IS,W
	0754	0925	WEIS														
	1010	1457	WEIS														
	1147	2112	SGMR														
	1417	2344	HARV							1419	2339	1					IN
	2034	2400	CULG				2034	2400		2034	2400						IS,W
29	0000	0734	CULG				0000	0734		0000	0734						IS,W
			CULG				0138	0139		0138	0140.5						IIIG,W
			CULG							0236							IIIB,W
			CULG				0535			0535							IIIB,W
	0955	1456	WEIS														
	1200	2118	SGMR														
	1417	2345	HARV														
	2044	2400	BOUL														
	2034	2400	CULG							2244	2244.5						IIIG,W
			CULG				2250	2400									IS,W
30	0000	0735	CULG							0009.5							IIIB,W
			CULG							0045.5							IIIB,W
			CULG							0112.5							IIIB,W
	0756	1457	WEIS														
	1158	2114	SGMR														
	2035	2400	CULG				2112.5	2113.5	1	2112.5	2113.5	1					IIIG
	1430	2400	BOUL							2112.8	2113.6	1	2112.8	2113.6	1		III
			CULG							2140.5		1					IIIB
			BOUL							2141.1	2141.2	1					III
			CULG							2200	2400	1					IS
			CULG				2205	2206	1	2205	2206	1					IIIG,U,V
	1416	2346	HARV				2205	2206	1	2205	2206	3	2205	2206	3		IIIGG,V
			BOUL							2205.2	2205.7	2	2205.2	2205.7	2		III
			CULG							2317.5							IIIB,W
31	0000	0735	CULG							0000	0735	1					IS
			CULG							0014							IIIB,W
			CULG							0022	0022.5						IIIG,W
			CULG							0039.5	0041.5	1					IIIG
			CULG				0152		1	0152		1					IIIB
			CULG							0158							IIIB,W
			CULG							0209							IIIB,W
			CULG				0309.5	0310.5	1	0309.5	0310.5	1					IIIG
			CULG							0427.5							IIIB,W
	0756	0836	WEIS														
	0841	1458	WEIS														
	1230	2117	SGMR														
	1417	2346	HARV							1426	2343	1					IN
			HARV				1553	1554	2	1553	1554	2					IIIGG
	1854	2400	BOUL														
	2035	2400	CULG							2035	2400	1					IS
			CULG				2231	2233	1	2231	2233	1					IIIG
			HARV							2232	2233	1					IIIG
			CULG				2317.5			2317.5							IIIB,W
			CULG				2320	2400	1								IN
										2330							IIIB,W

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: At Culgoora the band 2000 - 8000 MHz was not operating between December 6 at 0450 UT and December 17 at 2127 UT.

SELECTED SOLAR EVENTS

DECEMBER 1972

Culgoora

UT Date DEC. 1972	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions		Polar-ization	Inten-sity (1-3)		
				Central Dist. ($R_\odot$)	Position Angle (Deg.)				
12	0311.5 0456	0312.5 0457	160 80	.1 .2	70 20	0 0	1 1	III G III G	Similar at 0321 and 0358
13	0101 0330	0103) 0333)	160	.4 .5	330 300	0 0	2 2	III GG III GG	
16	0006.5 0341	0007 0400	80 (80 (160	1.1 0.9 0.7	290 250) 250)	0 0	1 2-3	III G IIIG V/IVs	Complex source structure IVs Polarized ℓ
17	0327	0329	80	1.1	270	0	1	III G	
18	0348 0410	0349 0414	80 (80 (160	1.1 1.1 1.0	260 260) 260)	0 0 0	1 3	III G III GG,V	
19	0222	0227	(80 (160	1.2 1.0	240 240	0 0	2	III GG,V	
30	2240	0500	(80 (160	1.3	90	ℓ	(1 (2	IV S	

Days without Heliograph observations: 1, 2, 3, 4, 5, 6, 7, 14, 15

COSMIC RAY INDICES

(Neutron Monitors)

DECEMBER 1972

Dec. 1972	CHURCHILL DAILY AVERAGE COUNTS PER HOUR	DEEP RIVER DAILY AVERAGE COUNTS PER HOUR	CALGARY DAILY AVERAGE COUNTS PER HOUR	SULPHUR MT. DAILY AVERAGE COUNTS PER HOUR	CLIMAX DAILY AVERAGE COUNTS PER HOUR	DALLAS DAILY AVERAGE COUNTS PER HOUR
1	data not available at time of publication	data not available at time of publication	11782.0	8825.1	data not available at time of publication	6327.1
2			11712.1	8813.7		6316.4
3			11810.6	8882.2		6342.8
4			11815.6	8902.4		6345.4
5			11842.6	8911.0		6346.3
6			11844.8	8916.4		6341.0
7			11842.7(23)	8911.1		6349.9
8			-- (0)	8825.9		6280.4
9			11714.7(19)	8818.3		6290.2
10			11770.9	8837.9		6304.0
11			11824.5	8890.0		6269.2
12			11856.8	8917.9		6293.8
13			11774.3	8854.0		data for rest of month not available at time of publication
14			11711.6	8779.3		
15			11696.4	8745.4		
16			11614.4	8671.6		
17			11629.5	8707.6		
18			11685.3	8754.9		
19			11733.4	8796.4		
20			11813.0	8841.0		
21			11822.9	8844.3		
22			11844.0	8846.5		
23			11619.6	8657.4		
24			11623.5	8662.3		
25			11710.1	8692.8		
26			11739.7	8739.9		
27			11816.2	8798.6		
28			11775.4	8762.4		
29			11786.1	8756.7		
30			11749.2	8762.5		
31			11800.0	8737.8		

( ) Number of hours for which data are available if less than 24 (or number of section hours if less than 40 for Climax).

Churchill and Dallas Super Neutron Monitors, Scaling Factors 120.

Deep River Super Neutron Monitor, Scaling Factor 300.

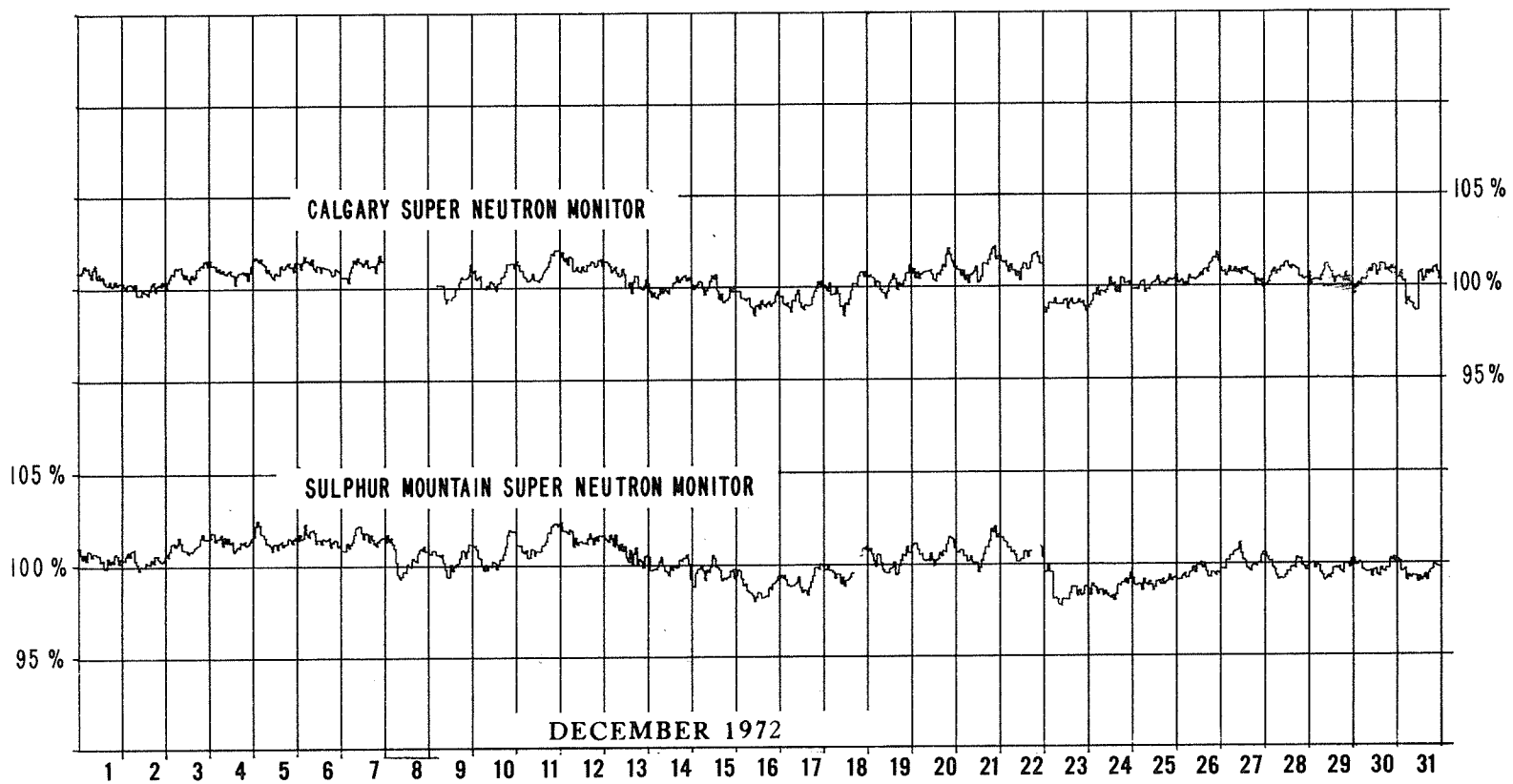
Calgary and Sulphur Mountain Super Neutron Monitors, Scaling Factors 100.

Climax IGC Station B305, Scaling Factor 100.

COSMIC RAY INDICES

(Pressure Corrected Hourly Totals)

DECEMBER 1972



GEOMAGNETIC ACTIVITY INDICES

DECEMBER 1972

DAY		K_p THREE-HOUR RANGE INDICES 1	2	3	4	5	6	7	8	SUM	C_i	C_p	A_p
1		3	3-	2-	1-	0+	1	1-	0+	10+	0.2	0.3	6
2		1-	1+	1+	1+	0+	2+	2	1	10+	0.3	0.2	5
3		2	2+	2-	1	1	1+	2+	2	14-	0.3	0.3	6
4	Q	1+	1+	2	1	1-	1-	1-	1-	8+	0.1	0.1	4
5	QQ	0+	0	0+	0	0	0+	0+	1+	3-	0.0	0.0	2
6	QQ	1+	1+	0+	0+	0	1-	1+	1	5	0.0	0.0	3
7		2	2+	3-	3	3-	3-	2+	0+	18	0.7	0.5	10
8		0+	2	1	2	1+	2	2	2+	13	0.3	0.3	6
9	Q	1+	0	1-	0+	0+	1	1+	2	7	0.1	0.1	4
10	QQ	1+	1-	1	0	0	0	1-	0+	4	0.0	0.0	2
11	Q	2-	1-	0+	1-	1-	1-	0+	1	6	0.1	0.1	3
12		1	1-	1-	1-	2-	1+	2+	4	12+	0.5	0.4	8
13	D	5+	4	4-	4-	4-	5-	4-	4	33-	1.4	1.3	30
14		3-	3-	2-	1+	3	3-	2-	1	17-	0.4	0.5	9
15	D	1	3-	3	4	4-	2+	4+	7-	28-	1.5	1.3	29
16	D	4+	5	5-	4+	4-	4-	5-	4	34+	1.4	1.3	33
17		3	3-	3-	4-	3+	2+	2+	2-	22-	0.6	0.7	13
18		2	2	2-	2	3-	3-	2-	2	17-	0.5	0.4	8
19		2-	2-	1+	1	1+	3-	2-	3	14+	0.4	0.4	7
20	Q	1+	2	1	1+	1-	0+	1	1	9-	0.1	0.1	4
21	QQ	0+	0	0	0+	1	0	0+	1	3	0.1	0.0	2
22		1	0+	1-	2	3+	3+	4	4+	19	1.0	0.8	14
23	D	5	5	4+	3	3-	3+	5	3	31+	1.4	1.3	30
24		5-	3+	4-	3-	1+	1-	0	1-	17	0.6	0.7	13
25	Q	1+	0+	0+	1-	1-	1-	1+	2+	8-	0.2	0.1	4
26		0+	2-	1	1+	2+	1+	1-	1	10-	0.1	0.2	5
27	QQ	1	2-	0+	0	0	0	0+	0+	4-	0.1	0.0	2
28		0	1	0	1	2	1+	2+	2-	9+	0.2	0.2	4
29		3	4-	3	2-	2	4-	3-	3+	23	0.9	0.8	15
30	D	3+	3	3-	4-	2+	2+	4+	4+	26	1.2	1.0	19
31		2-	3+	3	3+	2+	2-	2	4-	21	0.6	0.7	13
										MEAN	0.49	0.45	10

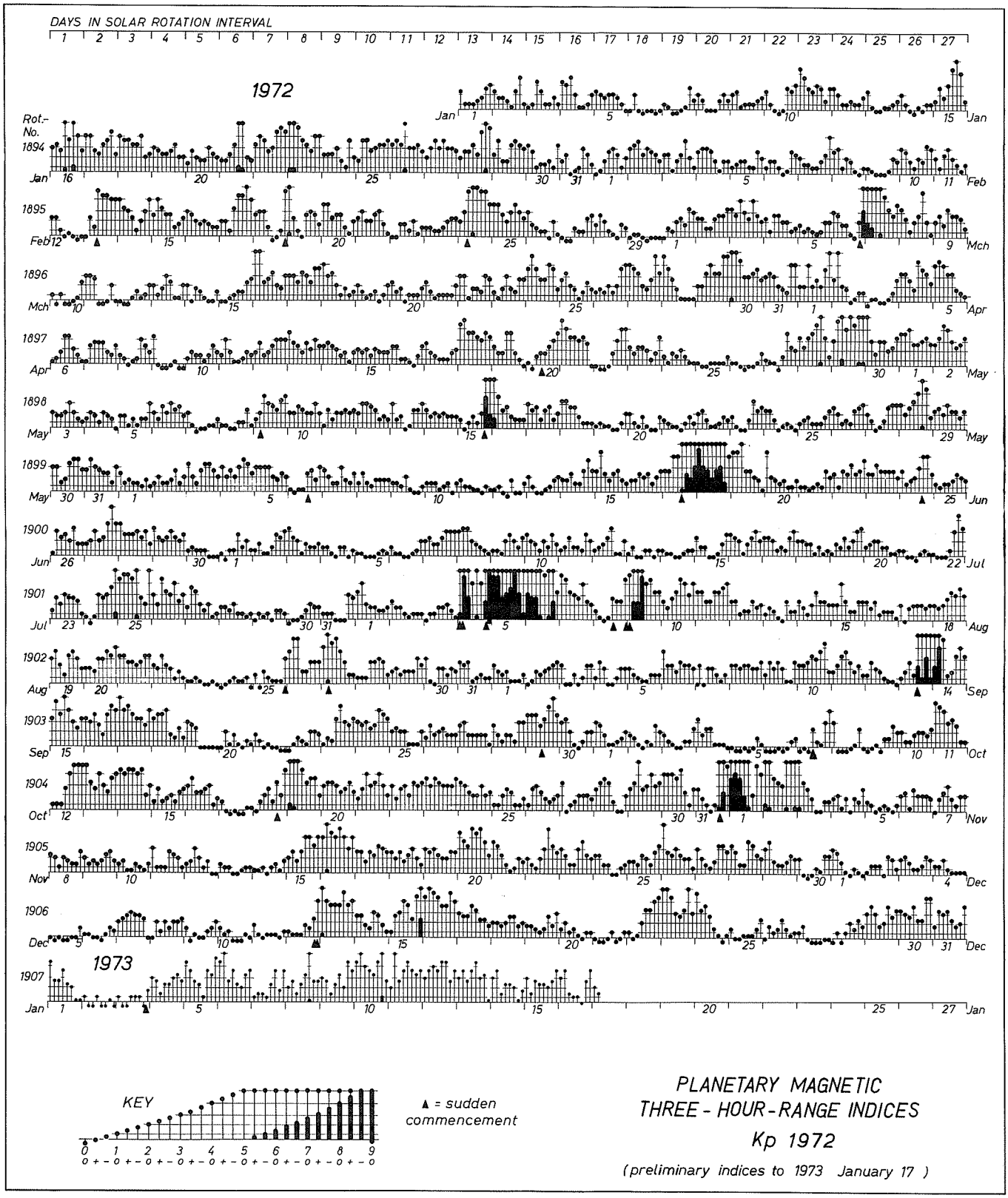
GEOMAGNETIC ACTIVITY INDICES

See next page for Kp chart for the year 1972.

DAILY AVERAGE INDICES Ap

1972

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	7	7	8	17	18	6	5	10	5	7	98	6
2	8	13	10	11	18	6	7	5	6	5	42	5
3	6	9	16	4	7	12	7	5	5	4	13	6
4	10	9	8	17	5	13	4	132	6	7	6	4
5	6	6	5	17	6	11	3	182	5	2	3	2
6	2	6	26	8	9	7	4	87	10	2	7	3
7	4	8	45	8	3	8	10	20	5	8	7	10
8	4	7	12	6	4	6	10	9	9	4	7	6
9	5	4	10	3	14	4	6	74	8	4	7	4
10	7	10	3	5	9	4	7	18	15	6	4	2
11	15	7	7	6	7	4	6	17	11	19	7	3
12	6	4	3	10	9	3	7	7	5	21	6	8
13	4	22	7	12	8	4	3	5	53	21	4	30
14	3	15	4	7	7	10	3	9	54	26	4	9
15	19	13	5	6	38	11	6	10	24	8	17	29
16	29	8	20	6	18	8	8	6	19	12	31	33
17	20	22	16	6	9	62	8	6	26	2	12	13
18	19	12	11	24	10	126	5	13	14	11	9	8
19	11	14	5	10	4	19	8	14	6	34	11	7
20	8	12	5	8	4	9	5	15	4	14	27	4
21	22	9	5	19	4	5	3	15	2	16	9	2
22	25	4	10	10	5	12	10	8	4	13	13	14
23	32	6	8	8	7	11	10	3	13	18	11	30
24	10	33	20	5	5	14	17	2	16	11	5	13
25	17	16	8	3	5	6	33	5	6	6	8	4
26	22	6	10	3	8	10	17	18	7	8	14	5
27	15	4	19	7	8	17	9	25	8	7	11	2
28	23	6	11	22	22	13	5	8	8	11	12	4
29	14	2	22	42	10	11	4	8	25	21	9	15
30	9		27	17	14	3	4	6	8	20	4	19
31	7		15		12		6	7		29		13
MEAN	13	10	12	11	10	14	8	24	13	12	14	10


DAYS IN SOLAR ROTATION INTERVAL
1972
Rot.-No.
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1973
1907
KEY
▲ = sudden commencement
PLANETARY MAGNETIC
THREE - HOUR - RANGE INDICES
Kp 1972
(preliminary indices to 1973 January 17)

R9	Rot.-No.	1st day	C9	
876 886 578	19	J17	3 1 2 1 1 2 . . 1 1 1 3 2 2 5 2 3 3	1 3 2 1 3 2
787 888 777	70	F13	1 3 2 1 3 2 1 . . . . 3 . 2 2 4 5 4 4 3 6 7 8 7 . .	1 2 . 1 . 1
645 787 777		M12	1 2 . 1 . 1 1 1 1 . . 1 . . . 4 5 4 4 7 1 3 3 2 5 2	3 5 . 2 1 .
887 556 677	1870	A 8	3 5 . 2 1 . . 1 4 6 5 5 5 7 7 4 4 4 3 3 1 2 5 3 2 3 1	3 1 1 . . .
768 888 777	71	M5	3 1 1 . . . . 4 1 3 3 1 3 1 1 3 2 1 2 1 1 . 4 7 3 3 1	6 2 3 2 1 .
644 788 667	72	J 1	6 2 3 2 1 . 2 3 1 1 1 1 2 2 3 2 3 6 2 5 4 . . 1 1 3 6	2 1 1 3 3 5
788 765 477	73	J 28	2 1 1 3 3 5 6 4 4 1 3 7 6 3 4 3 2 1 1 2 1 1 6 3 2 6	8 5 4 . 7 2
886 555 677	74	J 25	8 5 4 . 7 2 4 . 1 . . . 2 3 6 5 2 2 2 1 1 2 8 8 6 4 .	1 1 2 . 2 4
777 777 755	75	A21	1 1 2 . 2 4 3 3 2 1 3 5 5 4 3 2 1 1 2 1 1 . 1 6 5 3 2	2 3 5 4 5 3
577 654 555	76	S17	2 3 5 4 5 3 1 1 2 1 5 1 1 2 3 2 4 6 2 1 . . . 1 4 4 2	2 . 6 6 6 3
665 677 655	77	O14	2 . 6 6 6 3 1 . 5 6 4 1 . 1 4 3 2 . . . 2 1 2 3 7 2 2	4 5 2 2 1 .
678 765 666	78	N10	4 5 2 2 1 . 1 1 5 4 . 6 5 5 3 3 2 2 2 . . . . . 1 2 2	2 5 1 . . .
676 566 555	1879	D 7	2 5 1 . . . 1 7 4 . . . 2 2 . 1 2 4 . . 2 5 3 3 . . 1 5	6 4 2 1 . .
556 657 777	19	J 3	6 4 2 1 . . . 1 2 . 1 2 2 2 1 4 3 6 3 2 1 3 2 . 6 6 4	6 4 4 2 . .
665 455 677	71	J 30	6 4 4 2 . . . 1 1 3 3 2 1 1 . 4 6 6 4 3 2 2 1 . 4 3 7	6 3 1 1 . 2
665 345 544		F26	6 3 1 1 . 2 4 1 1 . 4 1 4 1 5 6 6 5 4 2 1 4 3 . . . 4	3 4 2 . . 2
444 444 777	1883	M25	3 4 2 . . 2 6 3 1 4 6 3 4 1 1 7 6 6 3 2 6 6 4 2 3 2 1	5 4 3 . . 1
544 355 555	84	A21	5 4 3 . . 1 2 5 2 2 1 4 2 2 2 7 6 4 3 3 1 . . 4 3 1 7	6 2 1 1 3
432 444 322	85	M18	6 2 1 1 3 2 1 2 . . 1 5 . 5 6 6 2 1 1 . 2 . . 1 . 2	1 1 1 3 1 .
233 467 654	86	J 14	1 1 1 3 1 . . 1 1 2 1 6 3 . 2 5 3 3 4 1 2 1 2 . 2 1 .	1 2 2 2 1
456 775 553	87	J 11	1 2 2 2 1 . 1 2 . 5 2 2 1 . 4 2 1 1 2 2 1 4 . 1 4 .	1 3 2 3 4 3
454 467 522	88	A 7	1 3 2 3 4 3 1 . 1 2 3 4 . . 2 2 3 2 1 3 . 1 1 1 6 3 .	1 2 4 3 5 3
352 355 534	89	S 3	1 2 4 3 5 3 2 1 1 2 4 2 2 3 3 7 2 4 1 . . 1 6 5 6 2 1	5 5 5 5 3 4
543 332 456	1890	S 30	5 5 5 5 3 4 5 4 5 6 2 3 2 4 2 2 . . . . . 1 2 1 3 1 .	. 4 6 4 1 1
555 543 235	91	O 27	. 4 6 4 1 1 . . 1 1 . 2 2 . 1 4 2 . . . . 2 1 1 3 6	7 6 7 5 2 3
676 456 667	92	N 23	7 6 7 5 2 3 1 1 1 1 3 2 1 . . . 2 . 1 2 4 . . 2 7 5 3	. 3 5 3 1 1
665 444 423	1893	D 20	. 3 5 3 1 1 3 . . 4 4 2 2 2 1 3 1 . . 1 1 4 1 . . 5	6 5 5 3 2 5
457 664 344	19	J 16	6 5 5 3 2 5 6 6 3 4 5 4 5 4 2 1 2 4 2 2 1 1 2 1 . 3 1	. 5 4 3 2 5
578 876 655	72	F12	. 5 4 3 2 5 3 4 3 2 1 1 6 4 1 1 1 . 2 3 4 2 1 6 7 3 3	. 1 . 1 . 1
577 775 333		M10	. 1 . 1 . 1 5 4 3 1 1 1 2 2 5 2 3 5 3 5 6 4 4 3 . 4 4	2 2 1 . 1 1
555 556 642	1897	A 6	2 2 1 . 1 1 3 3 2 1 1 1 5 2 2 5 3 2 1 . . . 1 5 7 4 5 5	2 1 1 2 . .
356 777 544	98	M 3	2 1 1 2 . . 4 2 2 2 2 1 6 5 2 2 . . . 1 2 1 1 2 2 5 2	4 3 1 1 3 4
677 546 665	99	M 30	4 3 1 1 3 4 3 1 2 1 . . . . 1 2 3 2 7 8 5 2 1 3 3 4 1	2 4 3 3 . 1
556 655 555	1900	J 26	2 4 3 3 . 1 2 2 . . 3 2 1 2 1 1 . . 1 2 2 1 2 1 . 2	2 4 6 4 2 1
567 664 334	01	J 23	2 4 6 4 2 1 . . 1 . 1 . 8 8 7 5 2 7 5 4 1 1 2 2 1 1 3	4 4 4 2 . .
455 875 543	02	A 19	4 4 4 2 . . 1 5 6 2 2 1 1 1 1 1 1 1 3 1 2 2 4 3 1 7 7	6 5 6 4 1 .
435 555 542	03	S 15	6 5 6 4 1 . . 1 4 4 1 2 2 2 6 2 1 1 . 1 . . 2 . . 1 5	5 5 6 2 3 .
1 2 3 5 6 6 6 4 1	04	O 12	5 5 6 2 3 . 3 6 4 4 4 5 3 1 2 2 3 5 5 6 8 7 4 1 . 2 2	1 2 . 2 1 .
1 2 2 2 4 5 4 3 2	05	N 8	1 2 . 2 1 . . 4 6 3 2 3 6 2 4 3 1 2 4 3 3 2 1 1 1 1 .	. . 2 1 . .
2 3 5 5 4 5 4 2 2	1906	D 5	. . 2 1 . . . 2 6 2 6 6 3 2 2 . . 4 6 3 . 1 . 1 4 5 3	3 . . 3 5 5
	19	J 1	3 . . 3 5 5 2 4 4 6 5 5 4 2 3 3	
	73	J 28	preliminary	
		F24		

Symbol	.	1	2	3	4	5	6	7	8	9
$\bar{R}$ =	0	1-15	16-30	31-45	46-60	61-80	81-100	101-130	131-170	171...
R9, C9 =	0	1	2	3	4	5	6	7	8	9
Cp =	0.0-0.1	0.2-0.3	0.4-0.5	0.6-0.7	0.8-0.9	1.0-1.1	1.2-1.4	1.5-1.8	1.9	2.0-2.5

DAILY GEOMAGNETIC CHARACTER FIGURES C9 AND 3-DAY MEAN SUNSPOT NUMBERS R9

For explanation and previous years see J. Bartels, Abhandlungen der Akademie der Wissenschaften zu Göttingen, Beiträge zum I.G.J., Heft 3 (1958) (may be requested from Institut für Geophysik, Postfach 876, 34 Göttingen, Germany).

PRINCIPAL MAGNETIC STORMS

DECEMBER 1972

DATE 1972 MO DA	STORM TIME UT START	STORM TIME UT END MO DA HR	OBS	GEO-MAG LAT.	SUDDEN COMMENCEMENT TYPE	AMPLITUDES D(')	AMPLITUDES H(γ)	AMPLITUDES Z(γ)	C FIGURE DEGREE OF ACTIVITY	MAXIMAL ACTIVITY ON K-SCALE 0 TO 9 MO DA	3-HOUR PERIOD	K INDEX	RANGES D (')	RANGES H (γ)	RANGES Z (γ)	STORM NUMBERS
12 07	0200	12 07 24	HYDE	7.6N	..	..	..	..	M	12 07	3,4,6	4	2	63	11	54
12 12	16--	-- -- --	COLL	64.6N	..	..	..	..		-- --	-	-	--	--	--	55
	2145	12 14 02	COLL	64.6N	SC *	- 5	+ 8	+ 4	MS	12 13	4,5	6	104	1100	560	55
	2142	12 14 09	NEWP	55.1N	..	..	..	..	M	12 13	2,3,4	5	28	104	102	55
	2145	12 14 10	BOUL	49.0N	..	..	..	..	M	12 13	2,4	5	21	105	35	55
	20--	12 14 20	IRKU	40.8N	..	..	..	..	M	12 13	6	6	18	116	35	55
	20--	12 14 02	TUCS	40.4N	..	..	..	..	M	12 13	3,4,8	5	10	120	5	55
	2145	12 13 24	ALIB	9.5N	SC	- 0.1	+ 9	- 1	M	12 13	1,2,6	5	3	111	23	55
	0530	12 13 24	HYDE	7.6N	..	..	..	..	M	12 13	6	5	3	131	18	55
	2145	12 13 24	ANNA	1.5N	SC	- 0.5	+11	+ 5	M	-- --	-	-	3	123	56	55
	2145	12 13 24	TVAN	1.1S	SC	0.0	+ 9	+12	M	-- --	-	-	2	151	82	55
	2145	12 14 00	PMOR	18.6S	SC	- 0.4	+11	+ 8	M	12 12	8	5	7	110	50	55
										12 13	1	5				55
	21--	12 14 01	HRMN	33.3S	..	..	..	..	M	12 13	1,6	5	23	114	108	55
	2145	12 14 00	GNAN	43.2S	SC *	+ 1 *	+ 6	+ 6 *	M	12 13	1	5	--	80	110	55
	2146	12 14 12	TOOL	46.7S	SC	- 1.8	+ 7	0	M	12 13	2,6	5	20	75	48	55
	2002	12 17 14	KGLN	57.3S	SC	--	--	--	S	12 15	8	8	--	--	--	55
12 15	08--	12 17 03	COLL	64.6N	..	..	..	..	MS	12 15	5	6	153	1070	880	56
										12 16	4,5	6				56
	08--	12 17 15	SITK	60.0N	..	..	..	..	MS	12 16	4	6	60	300	360	56
	05--	12 17 18	NEWP	55.1N	..	..	..	..	M	12 15	4	5	28	117	127	56
										12 16	2					56
	19--	12 17 01	FRED	49.6N	..	..	..	..	M	12 15	4	5	23	120	47	56
										12 16	6					56
	08--	12 17 20	IRKU	40.8N	..	..	..	..	M	12 15	8	6	26	95	37	56
	08--	12 17 14	TUCS	40.4N	..	..	..	..	MS	12 15	8	6	13	140	10	56
	03--	12 17 15	HONO	21.1N	..	..	..	..	M	12 15	8	5	5	92	18	56
	0300	12 16 20	HYDE	7.6N	..	..	..	..	M	12 15	5	5	5	116	20	56
	20--	12 16 24	HRMN	33.3S	..	..	..	..	MS	12 15	8	6	22	96	75	56
	02--	12 17 21	GNAN	43.2S	..	..	..	..	M	12 15	8	5	13	80	110	56
	0200	12 20 09	TOOL	46.7S	..	..	..	..	M	12 15	8	5	13	140	45	56
12 22	10--	12 24 11	TUCS	40.4N	..	..	..	..	M	12 23	1	5	8	80	10	57
	0920	12 24 08	HYDE	7.6N	..	..	..	..	M	12 22	7	5	3	106	18	57
	04--	12 24 12	GNAN	43.2S	..	..	..	..	M	12 22	8	5	13	80	120	57
										12 23	1	5				57
	10--	12 24 14	KGLN	57.3S	..	..	..	..	MS	12 23	7	7	--	--	--	57
12 23	09--	12 24 03	HRMN	33.3S	..	..	..	..	M	12 23	7	5	23	81	98	57
12 28	1900	12 31 14	HYDE	7.6N	..	..	..	..	M	12 29	6	5	2	94	18	58

Reports were received from the following observatories:

College	Newport	Boulder	Tucson	Honolulu	Hyderabad	Annamalainagar	Apia	Hermanus	Toolangi
Sitka	Fredericksburg	Irkutsk	San Juan	Alibag	Guam	Trivandrum	Port Moresby	Gnangara	Port-aux-Franais

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

DECEMBER 1972

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana)

The meaning of the station symbols is given in the IAGA-Bulletins nr. 12 and 32. Times of ssc, si and bay-commencements are mean values. If given by ten or more stations they are underlined.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

12 2145 B: ES MA CI PM HU PP LM DU; C: WN WI VI AQ EB KA (si: B: FU)

Sudden impulses found in the magnetograms (si)

07 1747 A: LG; B: ES WN EB; C: KA (ssc: A: HU; B: LM - bs: A: KS - bp: B: MA FU; C: TL)

12 2352 B: PM HU PP; C: TL (ssc: B: LM - bp: B: MA - bps: C: NI)

Rapid variations in form of bays (b, bs, bp, bps)

12 2001 bp: A: WN; B: MA IK; C: EB - bps: A: NU FU; B: WI; C: NI (ssc: A: SO B: LG LM KG; C: DB TL?)

15 2124 bs: A: KS - bp: A: MA AQ EB - bps: A: WN DB IK TL LM (si: A: LG)

23 1853 bp: A: SO MA FU AQ EB LM; B: KG - bps: A: WN DB IK TL; B: NI (si: A: LG)

30 2017 bp: A: FU; B: WN MA IK EB TL LM KG - bps: B: NI

Giant pulsations (pg)

13 0644 - 0827 MA

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

24 0958 - 1010 NI

RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

North Atlantic — DECEMBER 1972

DEC. 1972	WHOLE DAY INDICES NORTH ATLANTIC	ADVANCE FORECASTS (JC-REPORTS) FOR WHOLE DAY	NORTH ATLANTIC 6-HOURLY QUALITY FIGURES 00 TO 06	06 TO 12	12 TO 18	18 TO 24	SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF 02	08	14	20	GEOMAGNETIC INDICES K_{FR} HALF DAY (1)	(2)	A_{FR} OBSERVED
01	6o	6	6−	6−	7−	6+	6	6	6	7	1	0	2
02	6+	6	6+	7−	6o	6+	6	6	6	6	1	1	3
03	6+	6	6o	6o	6+	6+	6	6	6	6	2	2	5
04	7−	6	6+	7−	7−	7−	6	6	5	7	2	0	3
05	7−	6	7−	7−	6o	7o	6	6	5	7	0	1	1
06	6+	6	6+	6+	6+	6+	6	6	6	7	0	1	1
07	7−	6	6o	7−	7o	6+	6	6	6	6	3	2	11
08	6+	6	6+	6o	7−	6+	6	5	6	7	2	1	5
09	6+	6	6o	6o	7−	6+	6	6	6	6	1	1	2
10	6+	6	7−	6o	6+	6+	6	6	6	6	1	0	2
11	6o	6	6+	5+	6+	6+	6	6	6	7	1	0	2
12	6+	6	6+	6+	6+	6+	6	6	6	7	1	2	6
13	6+	6	6o	6+	7−	6+	6	5	5	5	(4)	(4)	25
14	7−	5	6o	6+	7o	7o	5	5	5	5	2	2	8
15	6+	5	7−	6o	7−	6−	6	5	5	6	3	3	17
16	6−	6	5o	6−	6+	6−	5	4	5	5	(4)	3	24
17	6−	6	5+	6o	6o	6−	5	5	5	5	3	2	10
18	6o	6	6−	6+	6o	6o	5	5	6	6	2	2	6
19	6+	6	6+	7−	6+	6+	6	6	6	6	2	2	6
20	6+	6	6+	6o	7−	6o	6	6	6	7	2	1	5
21	6o	6	6o	6o	6+	6o	6	6	6	7	0	1	1
22	6+	6	7−	6o	6+	6o	7	6	6	6	1	3	9
23	6+	6	6+	7−	7−	6o	5	5	5	5	(4)	3	19
24	6o	6	6+	7−	6−	6o	5	5	5	5	3	1	10
25	6+	6	6o	6o	7−	7−	5	6	6	6	1	1	3
26	6+	6	7−	7−	6o	6+	6	6	6	6	1	1	3
27	6+	6	6+	6+	7−	6o	6	5	6	7	1	0	1
28	7−	7	7−	7−	7−	7−	7	6	6	6	1	1	2
29	7−	7	7−	6+	7−	6+	6	5	5	6	2	2	9
30	6+	7	7−	6o	7−	6−	5	5	5	5	3	3	15
31	6+	6	6o	6o	7−	6+	5	5	5	5	3	2	12

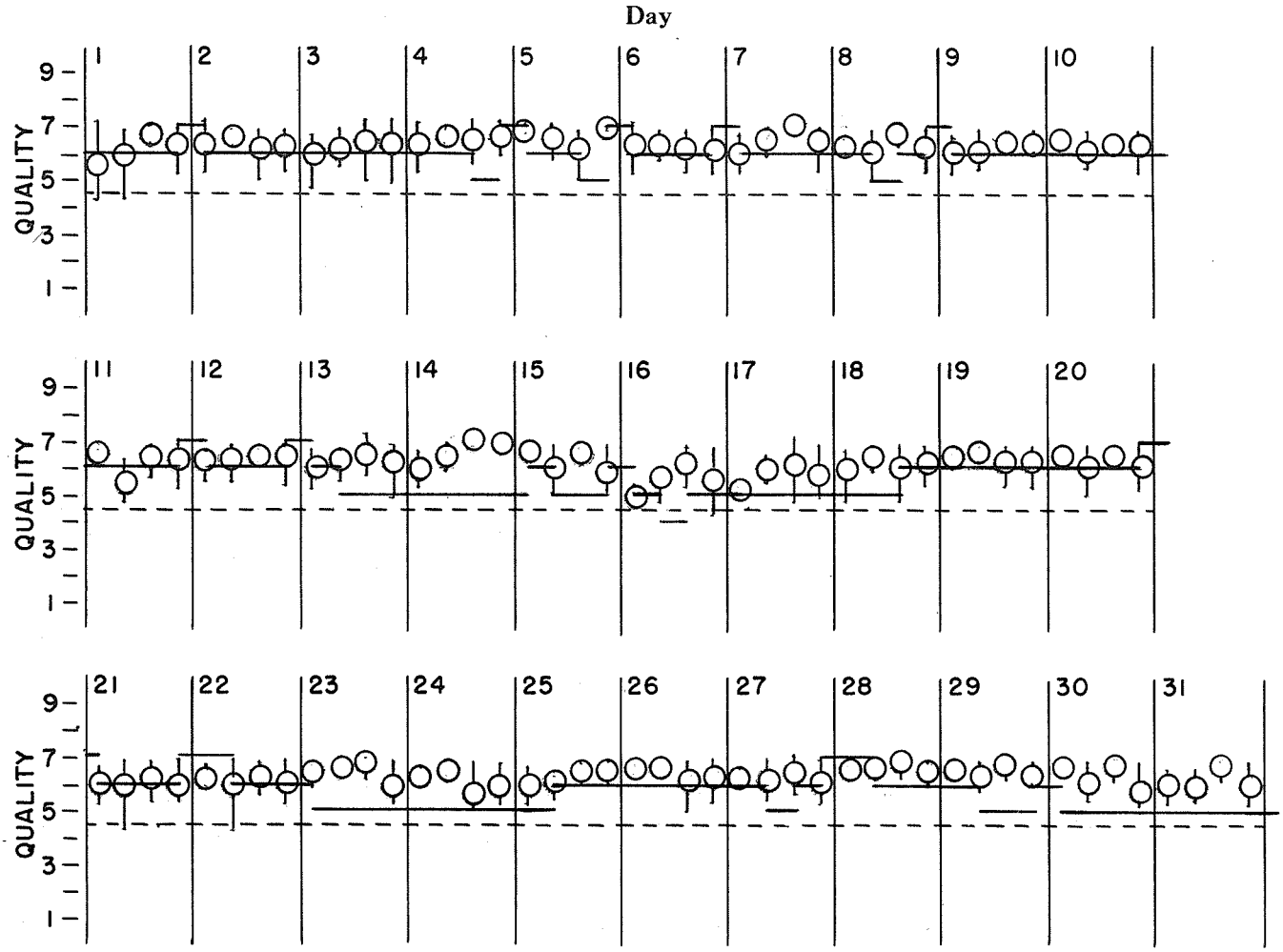
RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

DECEMBER 1972

North Atlantic

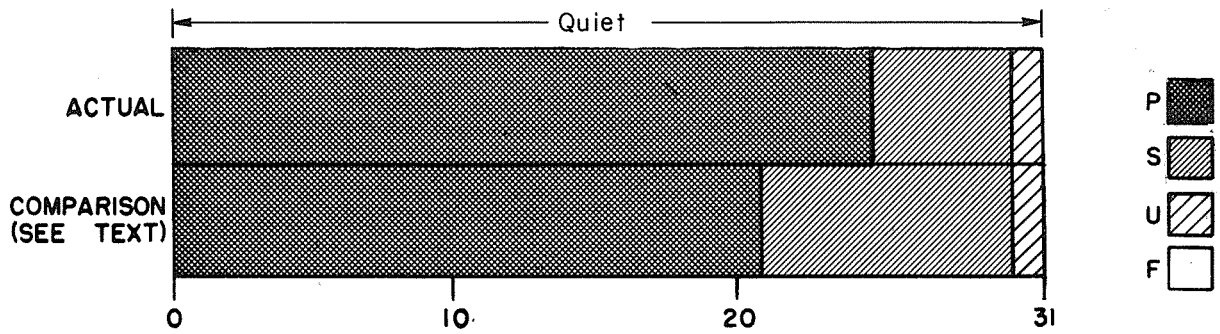
– Short term forecast
o Quality figure

1 range of reports



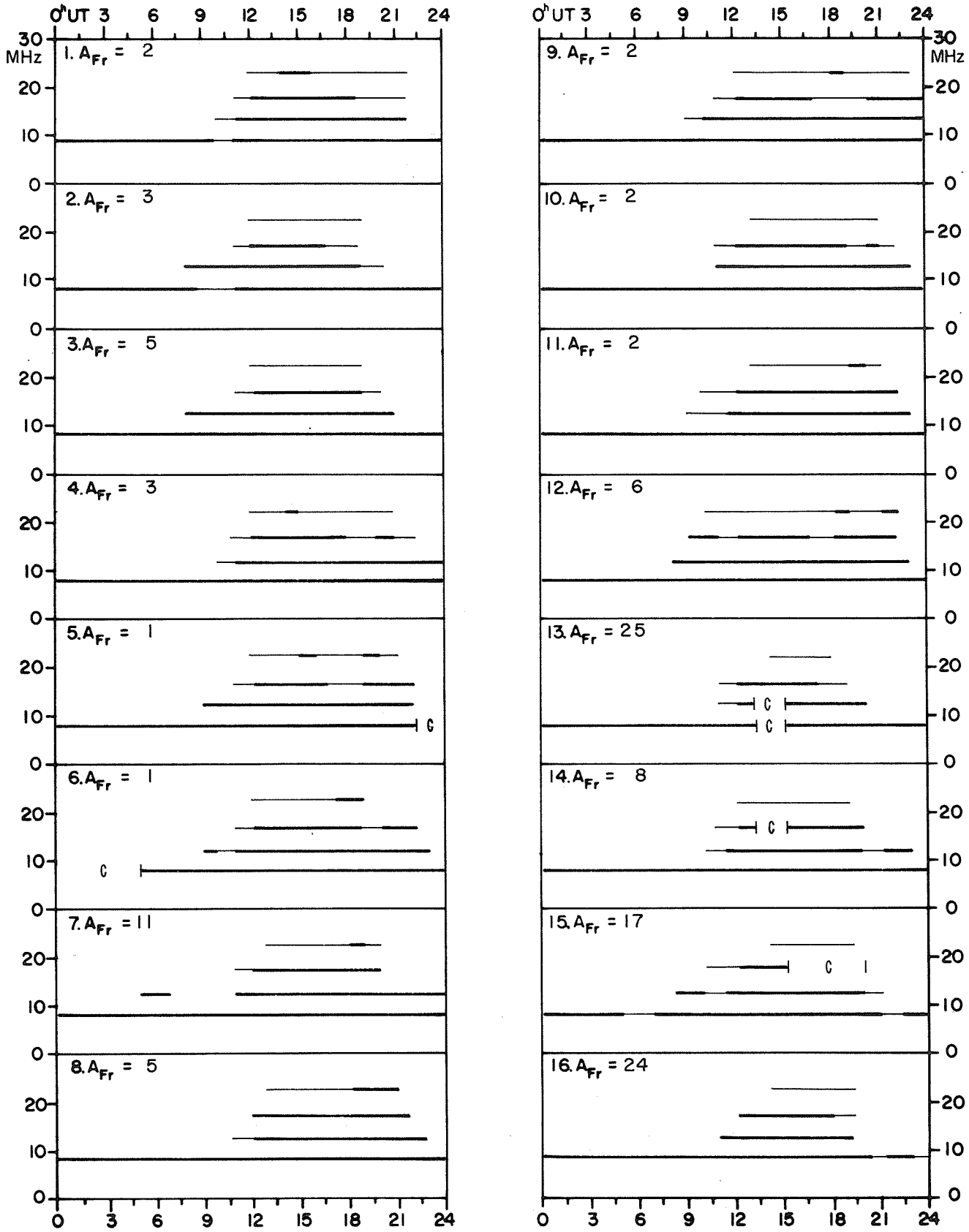
Outcome of advance forecasts of High Latitude radio propagation conditions
(Scored against observed North Atlantic radio propagation conditions)

HIGH LATITUDE



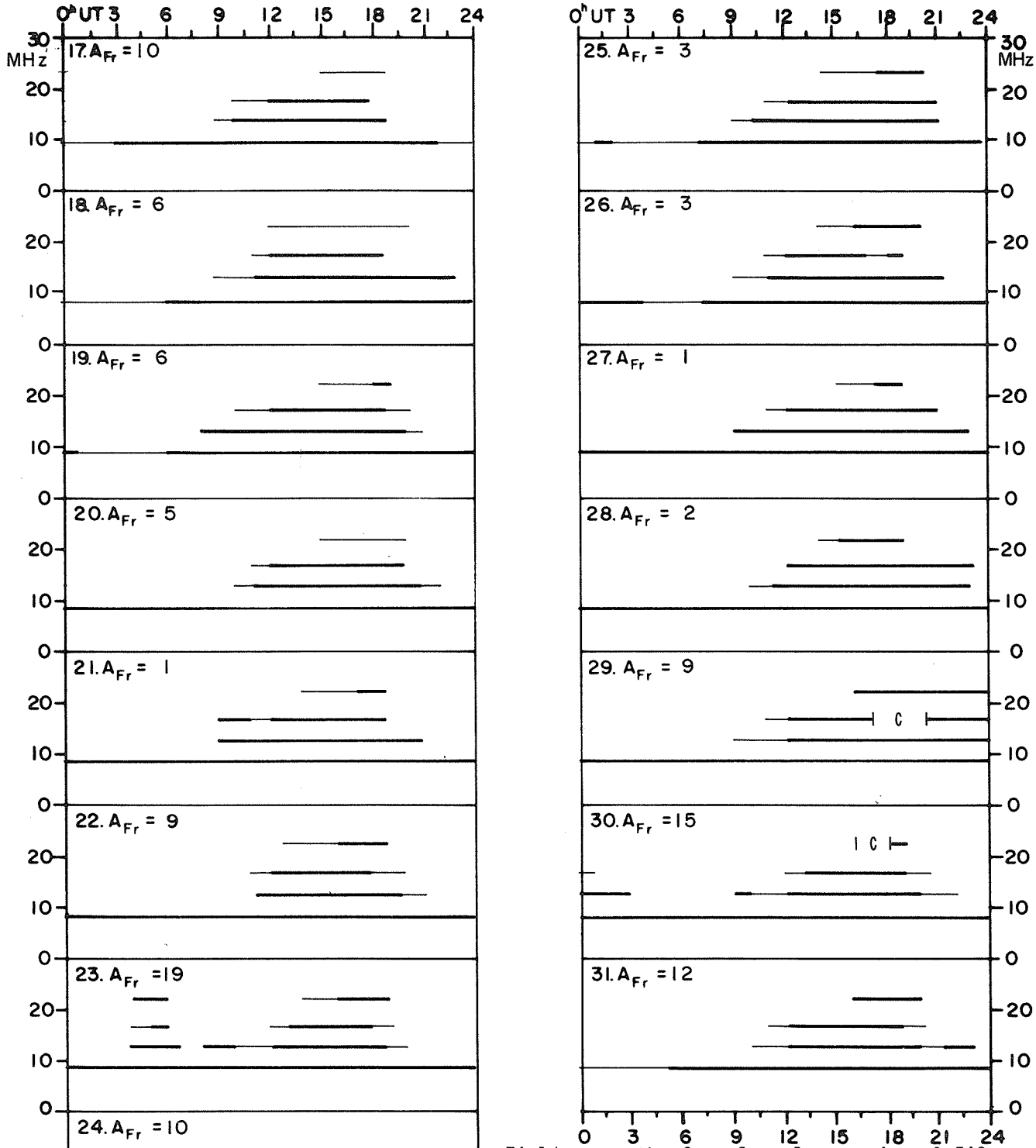
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

DECEMBER 1972



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

DECEMBER 1972



Field strengths from four frequencies, 8.542, 12.813, 17.084 and 22.378 MHz, as observed on a Lüchow - Halifax circuit are represented above. Heavy solid lines represent field strengths ≥-12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. **Adapted from Observations by Deutsche Bundespost**

RADIO PROPAGATION QUALITY INDICES

DECEMBER 1972

Calculated from the records of four frequencies
on the circuit Lüchow - Halifax (Germany - Canada)

Date	Day	Night	D+N
1	6.0	4.2	5.5
2	5.1	4.9	5.1
3	5.8	5.0	5.7
4	6.5	5.2	6.1
5	6.8	4.7	6.1
6	6.9	6.1	6.6
7	7.3	6.3	7.0
8	7.9	5.9	7.2
9	7.7	6.0	7.0
10	6.2	5.9	6.1
11	6.4	6.7	6.6
12	7.9	6.2	7.3
13	4.8	5.1	5.0
14	5.5	4.7	5.3
15	4.5	7.0	5.6
16	5.0	4.2	4.8
17	4.7	3.8	4.5
18	5.9	5.3	5.7
19	5.6	4.5	5.3
20	5.7	4.5	5.0
21	6.2	5.1	5.5
22	5.6	7.6	6.3
23	5.2	6.2	5.4
24	6.0	4.5	5.1
25	6.1	4.9	5.5
26	6.0	5.5	5.6
27	7.0	5.8	6.2
28	7.3	6.6	6.6
29	8.0	6.2	6.9
30	5.7	4.2	5.0
31	6.2	4.4	5.2

USCOMM-NOAA-ASHEVILLE,NC-2-28-73-1125

WORLD DATA CENTER A
FOR
SOLAR-TERRESTRIAL PHYSICS

The ICSU Panel on WDCs has recommended that it would be appropriate courtesy to acknowledge in publications that data were obtained from the originating station or investigator through the intermediary of the WDCs. The following statement is suggested:

"Data used in this study were provided by WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder Colorado 80303, USA."