The White Light Solar Corona:
December 1982–January 1984

K. Rock
R. Fisher
C. Garcia
P. Seagraves
E. Yasukawa
Preface

The synoptic observing project of the High Altitude Observatory's Coronal Dynamics Program began on 5 August 1980. The data obtained by the Mark-III K-coronameter located at the Mauna Loa Solar Observatory, Hawaii, are published yearly in volumes of *The White Light Solar Corona: An Atlas Of K-Coronameter Synoptic Charts* (Table 1). The reader will notice a segment of overlapped data at both the beginning and the end of each volume. This is necessary to provide a complete data set of Carrington rotations covering a specific time period because west limb passage occurs 14 days after east limb passage. There are two additional sections included in this volume, the Activity Report Summary for 1983 and Polar Synoptic Charts. Activity reports for the Mk-III operation prior to this year are given by Rock et al. (1983), and an atlas of polar projections of previous K-coronameter observations from Mauna Loa given by Fisher and Seagraves (1983).

This set of synoptic data should be regarded as a preliminary presentation in which no corrections have been made for the day-to-day variations in sky transmission and scattering of polarized light by the earth's atmosphere. While there is some inaccuracy incurred in neglecting these effects, it is still possible to use the data set as a characterization of the white light corona. Data from the east and west limbs are presented separately in the synoptic charts, as transient and evolutionary changes in the white light corona substantially modify the distribution of coronal material over the 14 days between sequential limb transits.

We would like to acknowledge the continuing support of the NCAR Graphics group, who prepared the contour charts.

Kristine Rock,
Mauna Loa Solar Observatory
Hilo, Hawaii
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>iii</td>
</tr>
<tr>
<td>I. Program Goal</td>
<td>1</td>
</tr>
<tr>
<td>II. Description of Data Products</td>
<td>4</td>
</tr>
<tr>
<td>A. Shaded Synoptic Contour Charts</td>
<td></td>
</tr>
<tr>
<td>B. Polar Charts</td>
<td></td>
</tr>
<tr>
<td>C. Activity Report</td>
<td></td>
</tr>
<tr>
<td>III. Acknowledgments</td>
<td>8</td>
</tr>
<tr>
<td>IV. References</td>
<td>9</td>
</tr>
<tr>
<td>V. Data Products</td>
<td>12</td>
</tr>
<tr>
<td>A. Shaded Synoptic Contour Charts</td>
<td></td>
</tr>
<tr>
<td>B. Shaded Polar Contour Charts</td>
<td></td>
</tr>
<tr>
<td>C. Activity Report</td>
<td></td>
</tr>
</tbody>
</table>
I. PROGRAM GOAL

The synoptic observing program of the Mauna Loa Solar Observatory (MLSO) has as its goal the specification of the time-dependent structure of the solar corona. The rate of change of the corona, at least in a global sense, for a period of time around sunspot maximum, was unknown at the outset of this study. The first year's operation of the coronal dynamics (C/D) instrument system yielded a data set that characterizes the coronal rate of change, for certain sized structures, at a time near the maximum of sunspot cycle 21. The second and third years of operation continue this effort in the declining phase of the sunspot cycle. In 1983, the fourth year of this study, clear signs of the approaching sunspot minimum are recorded.

Although more data are available from the C/D archive in Boulder, Colorado, the material presented here is in a format providing a convenient access to investigators intending to make correlation studies or an intercomparison of standard synoptic data sets.

K-Coronameter Observations

The device used to collect the data presented in the following pages is the imaging K-coronameter located at the Mauna Loa observing station of the High Altitude Observatory (HAO). The site is at +19° 31' north latitude, 155° 38' west longitude on the island of Hawaii. The system was described in detail by Fisher et al. (1981). The synoptic observing program was begun on day 212 (DOY 212) of 1980. This publication continues work presented in the earlier volumes of this series, Fisher et al. (1982a, b), and Rock et al. (1983). (See Table I)

A subset of the data, azimuthal polarized brightness (pB) values at three selected heights in the corona, is selected from each day's operation. This is done during the routine daily calibration procedure. Specific pB values
observed on the selected data set are estimated and recorded for the three heights. A discussion of the calibration system can be found in volume one of this atlas.

**TABLE I**

Mark-III K-Coronameter Data

<table>
<thead>
<tr>
<th>ATLAS #1</th>
<th>August 1980 - September 1981</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLAS #2</td>
<td>September 1981 - February 1982</td>
</tr>
<tr>
<td>ATLAS #3</td>
<td>December 1981 - January 1983</td>
</tr>
<tr>
<td>ATLAS #4</td>
<td>December 1982 - January 1984</td>
</tr>
</tbody>
</table>

Calibration data are available in Hilo, Hawaii, so that secular variation in instrument sensitivity, atmospheric scattering of polarized light, and atmospheric transmission may be studied, if necessary. The reader is reminded that a zeroth-order attempt has been made to correct for these effects in the data presented in this atlas, the first time such a correction has been made in the raw synoptic and polar charts. There are times when errors in the estimate of the true pB signal may be as large as a factor of two. These days--days with cirrus clouds or volcanic emission within the field of view--are rather evident and generally produce a "band," a vertical defect, in the synoptic maps.

The instrument resolution remains unchanged from the description given in 1981. The sample aperture is 3.2 arc seconds wide at the limb of the sun and increases linearly to a width of 22.5 arc seconds at a height of 2.3 \( R_0 \). The height of the sample aperture is 10.6 arc seconds, regardless of height above the limb. This produces an image which is limited to 20 arc seconds resolution at a height of 1.5 \( R_0 \). The resolution of the synoptic map is somewhat less than this in azimuth because of a process of "degitching." This numerical procedure is necessary for the routine removal of high spatial frequency noise. The source of this noise is particulate matter (or insects) drifting through the diode.
field of view during the time of observation. The occurrence of such noise is relatively uncommon during the periods of data sampling in this study, but it does produce high spatial frequency artifacts in the final data which are annoying if not removed. Some azimuthal smoothing has been applied to the data set so that the effective resolution in latitude is ±1°. The longitude resolution yielded by the K-coronameter technique is quite a different matter. Since this study used one observation per 24-hour period, the sampling theorem dictates that the minimum detectable separation of structures is two days' solar rotation as viewed from the earth, or about 26° of longitude.

MLSO operates seven days per week year round, weather permitting. A total of 317 days of observations were obtained during the 1983 calendar year. The computer interpolates the available data across a gap caused by cloudy conditions. It is not apparent in the shaded synoptic charts, but appears marked with an "X" in the DOY spaces at the bottom of each chart.

Synoptic data are kept on computer disk at the Mauna Loa site. Synoptic contour maps are prepared by the operations crew at the sea-level base in Hilo. The entire observing and data reduction effort is kept intact at the Hawaiian facility. Further requests concerning the material presented here, or questions concerning the method of preparation (or display) may be addressed to either:

R. Fisher  C. Garcia
High Altitude Observatory High Altitude Observatory
P.O. Box 3000 P.O. Box 425
Boulder, CO 80307 Hilo, HI 96721

For those readers requiring the Atlas data in digital format, it is now possible to write Atlas data onto 1600 bpi magnetic tape. Data users requesting digital data should supply the observatory with a blank tape and details of the time of coverage desired.
II. DESCRIPTION OF DATA PRODUCTS

A. Synoptic Contour Charts

The data are plotted in a rectangular format. Two heights, 1.3 and 1.7 $R_\odot$, are used, and the data from the east and west limbs are plotted separately. On days when it was impossible to observe, a notation of "X" is printed in the DOY space. Data for each Carrington rotation period are shown as surface contours with units of $pB$ defined to be $(10^{-8} R_\odot$ percent polarization). The latitude lines of 90°N, 0°, and 90°S are marked on each chart. Solar longitude is not used as the unit of measure along the abscissa; rather the data are plotted as a function of time. The Carrington rotation number is given under the title of the chart; the limb over which the observations were made and the height are given at the left-hand corner. Data from the highest scan, the "outer" scan, are not included in this work, since the average signal-to-noise ratio is, at best, about 1:1.

The synoptic contour plots have been converted into a format in which $pB$ resolution is quantified into five levels. This has been done to clarify the morphology of the corona for the identification of white-light structures with other solar features. The levels are specified in Table II.
TABLE II

Synoptic Chart Level in pB\times 10^{-8}

<table>
<thead>
<tr>
<th>Height</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3R⊙</td>
<td>1.7R⊙</td>
</tr>
<tr>
<td>BLACK</td>
<td>pB &lt; 0</td>
</tr>
<tr>
<td></td>
<td>pB &lt; -1</td>
</tr>
<tr>
<td>WHITE</td>
<td>0 &lt; pB \leq 4</td>
</tr>
<tr>
<td></td>
<td>-1 &lt; pB \leq 0</td>
</tr>
<tr>
<td>DOTTED</td>
<td>4 &lt; pB \leq 8</td>
</tr>
<tr>
<td></td>
<td>0 &lt; pB \leq 1</td>
</tr>
<tr>
<td>DASHED</td>
<td>8 &lt; pB \leq 12</td>
</tr>
<tr>
<td></td>
<td>1 &lt; pB \leq 2</td>
</tr>
<tr>
<td>LINED</td>
<td>&gt;12</td>
</tr>
<tr>
<td></td>
<td>&gt;2</td>
</tr>
</tbody>
</table>

Regions of lower density (black) frequently have negative values for the inferred polarized brightness. This is the result of scattering of photospheric light by the earth's atmospheric gases as well as scattering by small particles suspended in the line of sight. There is some variation in this effect from day to day. Ordinarily the effect of scattered light is quite small, less than ±0.3 pB peak to peak; but other variations can be introduced by natural phenomena. Effects of increased scattering due to volcanic debris from 1982 eruptions were still present in the 1983 data. However, by the end of the year it had gradually reduced to values seen in 1981.

B. Polar Charts

Following new developments with the FORTH code used by the Mauna Loa Solar Observatory, the ordinary coronal synoptic chart, usually depicted with a cylindrical projection, can now be drawn as if viewed from above the pole of rotation. It provides a different, interesting perspective from which to evaluate the evolution of coronal structures.
The initial motivation for the production of these plots was the desire to present data useful in the studies of high latitude coronal streamers and the variation of coronal hole areas.

This *Atlas* includes the 1983 charts produced from data taken at both the east and west limbs, at two heights 1.3 $R_\odot$ and 1.7 $R_\odot$ in the solar corona. The data are plotted by the POLES routine in the following manner: The north polar region is given on the left-hand portion of the page; the south polar region is shown on the right-hand portion. Each polar plot corresponds to a single Carrington rotation. Longitude is not used as a circumferential variable; this coordinate is replaced by the date of limb observation. Thus, each map is comparable to other data displayed in the usual Carrington format. The equator corresponds to the edge of the circular plot; the solar pole is at the center of each diagram. A "Carrington longitude" is indicated by a set of tic marks separated by ten degrees. The longitude boundary between 0° and 360° is indicated by a bold radius vector extending from the pole to the equator. The dates of observation of the beginning, mid-point, quarter, and three-quarters Carrington rotation are printed around the equatorial circle. Preserving the convention of right-handed rotation, time increases in a clockwise direction on the northern hemisphere plot; time increases in a counter-clockwise sense in the southern hemisphere plot. The diagrams are shown as true polar projections, so that the inferred latitude of any feature is obtained by measuring the normalized radius vector from the pole to some given feature, $r = d/R$, and setting the latitude $\theta$ equal to arc cos ($r$), where $d$ is the linear distance from the center of the plot, and $R$ is the pole-equator distance.

C. Activity Report

Since 1 February 1980, daily observations of the solar white light corona and the Hα limb have been made from Mauna Loa. Rock et al. (1983) summar-
izes the activity observed during the four years of observation since 1980.

The Activity Report is compiled from the daily observer's log, a running narrative written of the day's operations, and the prominence monitor quality control report which is written after the film has been developed and returned to Hilo for inspection. Copies of these logs are stored both in Hilo, Hawaii, and Boulder, Colorado. The digital data from the Mk-III coronameter are stored in Boulder, Colorado, and are designated with the NCAR computing center number V61XXX or V67XXX. Film from the Prominence Monitor is stored in Boulder, Colorado, and each roll is uniquely designated with a serial number for film roll and year. For example, the fifth roll of film exposed in 1983 is designated MLSO-05-83.

The list of specific events, as detected from the sources outlined above occurring in 1983, is entered in the table below. Data and day of year (DOY) are given in the first two columns. The third column contains a short characterization of the kind of activity detected, from either Hα observations from the Prominence Monitor or white light coronal changes detected with the Mk-III system. The three letter designation EPL, eruptive prominence loop, has been used in the report to characterize Hα mass ejected above the limb. Times for specific events are given in universal time (UT) and should be considered as accurate to ± 5 seconds. Event location is given in terms of position angle (PA) and radius vector (RV). Position angles are estimated to an accuracy of ± 6°, the radius vector estimates are given with an error band of ± 0.1 Rs. The last two columns refer to the Prominence Monitor film roll numbers and the Mk-III magnetic tape numbers on which the event was recorded.

Observational selection plays a role in the kinds of events recorded in this list. The reader is cautioned so that inaccurate event rates are not estimated by using this table as if it listed all activity detected from the data during this
period of time. Rather, this list contains only the information concerning the kinds of activity detected by the observing crew and recorded in one of the logs mentioned above. Obviously this is a subset of all solar activity occurring during this period.

III. ACKNOWLEDGMENTS

The authors acknowledge the assistance of C. Baker and S. Gentry in the preparation of this manuscript. The shaded synoptic charts were prepared by the NCAR Graphics group; valuable advice was contributed by C. Rasmussen of the NCAR Publications Department.
IV. REFERENCES


ATLAS IV 1983

<table>
<thead>
<tr>
<th>ROTATION #</th>
<th>EAST LIMB</th>
<th>WEST LIMB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ENDS</td>
<td>BEGINS</td>
</tr>
<tr>
<td>1730</td>
<td>12.4</td>
<td>350.0(82)</td>
</tr>
<tr>
<td>1731</td>
<td>39.6</td>
<td>12.4</td>
</tr>
<tr>
<td>1732</td>
<td>66.9</td>
<td>39.6</td>
</tr>
<tr>
<td>1733</td>
<td>94.2</td>
<td>66.9</td>
</tr>
<tr>
<td>1734</td>
<td>121.5</td>
<td>94.2</td>
</tr>
<tr>
<td>1735</td>
<td>148.7</td>
<td>121.5</td>
</tr>
<tr>
<td>1736</td>
<td>176.0</td>
<td>148.7</td>
</tr>
<tr>
<td>1737</td>
<td>203.2</td>
<td>176.0</td>
</tr>
<tr>
<td>1738</td>
<td>230.6</td>
<td>203.2</td>
</tr>
<tr>
<td>1739</td>
<td>257.8</td>
<td>230.6</td>
</tr>
<tr>
<td>1740</td>
<td>285.1</td>
<td>257.8</td>
</tr>
<tr>
<td>1741</td>
<td>312.4</td>
<td>285.1</td>
</tr>
<tr>
<td>1742</td>
<td>339.7</td>
<td>312.4</td>
</tr>
<tr>
<td>1743</td>
<td>1.9(84)</td>
<td>339.7</td>
</tr>
</tbody>
</table>

Last rotation will be completed on Thursday 1-19-84.
HIGH ALTITUDE OBSERVATORY MAUNA LOA

MK III K-CORONAMETER

ROTATION 1733  HEIGHT 1.7 R₀

EAST LIMB

NORTH

WEST LIMB

NORTH

SOUTH

SOUTH

X = NO DATA
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1735 HEIGHT 1.3 Rₖ

EAST LIMB NORTH
SOUTH
WEST LIMB NORTH
SOUTH

X = NO DATA
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1736  HEIGHT 1.3 R

EAST LIMB

NORTH

SOUTH

WEST LIMB

NORTH

SOUTH

D.O.Y. [174, 172, 170, 168, 166, 164, 160, 152, 156, 154, 150, 148]

X = NO DATA
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1737  HEIGHT 1.3 R_{\odot}
HIGH ALTITUDE OBSERVATORY MAUNA LOA

MK III K-CORONAMETER

ROTATION 1738  HEIGHT 1.7 R₉

EAST LIMB

NORTH

WEST LIMB

NORTH

SOUTH

SOUTH

X = NO DATA

PB  2  1  0  -1
HIGH ALTITUDE OBSERVATORY MAUNA LOA

MK III K-CORONAMETER

ROTATION 1739   HEIGHT 1.7 R₀

EAST LIMB

NORTH

+90

0

-90

SOUTH

WEST LIMB

NORTH

+90

0

-90

SOUTH

DOY

[256] [254] [252] [250] [248] [246] [244] [242] [240] [238] [236] [234] [232] [230]

X = NO DATA

PB 2 1 0 -1
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1741 HEIGHT 1.7 R⊙
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1742 HEIGHT 1.3 R_
EAST LIMB NORTH
WEST LIMB NORTH
SOUTH
X = NO DATA
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1742   HEIGHT 1.7 $R_\odot$

EAST LIMB NORTH

WEST LIMB SOUTH

X = NO DATA
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1730  HEIGHT 1.3 $R_\odot$

EAST LIMB

WEST LIMB

PB

0 4 8 12
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1730 HEIGHT 1.7 R$_\odot$

EAST LIMB

WEST LIMB
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1731   HEIGHT 1.3 \(R_\odot\)

EAST LIMB

<table>
<thead>
<tr>
<th>12.4</th>
<th>19.2</th>
<th>26.0</th>
<th>39.6</th>
<th>32.8</th>
<th>26.0</th>
</tr>
</thead>
</table>

| 39.6 | 32.8 | 26.0 | 12.4 | 19.2 | 26.0 |

WEST LIMB

| 26.0 | 32.8 | 39.6 | 53.3 | 46.5 | 39.6 |

| 53.3 | 46.5 | 39.6 | 26.0 | 32.8 | 39.6 |

PB

- 0
- 4
- 8
- 12
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1731 HEIGHT 1.7 R⊙

EAST LIMB
12.4
19.2
26.0
39.6
32.8
26.0

WEST LIMB
26.0
32.8
39.6
53.3
46.5
39.6
53.3
46.5
39.6
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1732  HEIGHT 1.3 R_

EAST LIMB

WEST LIMB

PB

0 4 8 12
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1732  HEIGHT 1.7 R☉

EAST LIMB
39.6  46.5  53.3  66.9  60.1  53.3
NORTH SOUTH

WEST LIMB
53.3  60.1  66.9  80.5  73.7  66.9
NORTH SOUTH
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1733  HEIGHT 1.3 R_

EAST LIMP

NORTH SOUTH

WEST LIMP
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1733  HEIGHT 1.7 \( R_\odot \)

**EAST LIMB**

<table>
<thead>
<tr>
<th>66.9</th>
<th>73.7</th>
<th>80.5</th>
<th>94.2</th>
<th>87.4</th>
<th>80.5</th>
</tr>
</thead>
</table>

**WEST LIMB**

<table>
<thead>
<tr>
<th>80.5</th>
<th>87.4</th>
<th>94.2</th>
<th>107.8</th>
<th>101.0</th>
<th>94.2</th>
</tr>
</thead>
</table>

The image contains two spherical diagrams representing different views of the solar atmosphere, with labeled latitude and longitude values. The diagrams are color-coded with a legend indicating the intensity or level of some astronomical phenomenon. The east and west limbs are indicated, with north and south poles marked. The data points suggest a high-altitude observational context, possibly related to coronal or solar activity studies.
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1734 HEIGHT 1.3 $R_\odot$

EAST LIMB

WEST LIMB
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1734  HEIGHT 1.7 R_

EAST LIMB

94.2 101.0 107.8 121.5 114.6 107.8

121.5 114.6 107.8 94.2 101.0 107.8

WEST LIMB

107.8 114.6 121.5 135.1 128.3 121.5

135.1 128.3 121.5 107.8 114.6 121.5

PB

-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1735 HEIGHT 1.3 R☉

EAST LIMB

WEST LIMB
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1735  HEIGTH 1.7 R₀

EAST LIMB

121.5 128.3 135.1 148.7
141.9 135.1

WEST LIMB

135.1 141.9 148.7 162.4
155.6 148.7

PB
-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1736 HEIGHT 1.3 R_☉

EAST LIMB

148.7 155.6 162.4 176.0 169.2 162.4

176.0 169.2 162.4 148.7 155.6

NORTH SOUTH

WEST LIMB

162.4 169.2 176.0 189.6 182.8 176.0

189.6 182.8 176.0 162.4 169.2 176.0

PB

0 4 8 12
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1736  HEIGHT 1.7 R_

EAST LIMB

WEST LIMB

PB

-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1737 HEIGHT 1.3 Rₐ

EAST LIMB

176.0 182.8 189.6 203.3 196.5 189.6

WEST LIMB

189.6 196.5 203.3 216.9 210.1 203.3
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1737 HEIGHT 1.7 R⊙

EAST LIMB

WEST LIMB
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1738 HEIGHT 1.3 R_

EAST LIMB

WEST LIMB
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1738  HEIGHT 1.7 R_E

EAST LIMB
203.3 210.1 216.9 230.6 223.7 216.9

WEST LIMB
216.9 223.7 230.6 244.2 237.4 230.6

PB
-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1739  HEIGHT 1.3 R⊙

EAST LIMB

WEST LIMB

PB I 4 8 12

...... :

0 --
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1739 HEIGHT 1.7 Rₜ

EAST LIMB

WEST LIMB

PB

-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1740 HEIGHT 1.3 R

EAST LIMB
257.8 264.6 271.5 285.1
NORTH SOUTH
278.3 271.5

WEST LIMB
271.5 278.3 285.1 298.7
NORTH SOUTH
291.9 285.1

PB
0 4 8 12
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1740  HEIGHT 1.7 R☉

EAST LIMB

WEST LIMB

PB

-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1741    HEIGHT 1.7 R⊙

EAST LIMB

285.1 291.9 298.7 312.4 305.6 298.7

NORTH SOUTH

312.4 305.6 298.7 285.1 291.9 298.7

WEST LIMB

298.7 305.6 312.4 326.0 319.2 312.4

NORTH SOUTH

326.0 319.2 312.4 298.7 305.6 312.4

PB

-1 0 1 2
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1742 HEIGHT 1.7 R⊙

EAST LIMB
312.4 319.2 326.0 339.7 332.8 326.0

WEST LIMB
326.0 332.8 339.7 353.3 346.5 339.7
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1743 HEIGHT 1.3 R⊙

EAST LIMB

WEST LIMB
HIGH ALTITUDE OBSERVATORY MAUNA LOA
MK III K-CORONAMETER
ROTATION 1743 HEIGHT 1.7 R☉

EAST LIMB
339.7 346.5 353.3 1.9 360.1 353.3
NORTH SOUTH
1.9 360.1 353.3 339.7 346.5 353.3

WEST LIMB
353.3 360.1 1.9 15.6 8.8 1.9
NORTH SOUTH
15.6 8.8 1.9 353.3 360.1 1.9

PB
-1 0 1 2
## MAUNA LOA SOLAR OBSERVATORY - ACTIVITY REPORT

### 1983

<table>
<thead>
<tr>
<th>DATE</th>
<th>DOY</th>
<th>ACTIVITY</th>
<th>TIME</th>
<th>PA</th>
<th>RV</th>
<th>MLSO FILM #</th>
<th>MAG TAPE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/03/83</td>
<td>34/83</td>
<td>EPL</td>
<td>2035-2045</td>
<td>112</td>
<td>1.2</td>
<td>03-83</td>
<td>V67285</td>
</tr>
<tr>
<td>02/18/83</td>
<td>49/83</td>
<td>EPL</td>
<td>1930-2012</td>
<td>70</td>
<td>1.35</td>
<td>04-83</td>
<td>V67287</td>
</tr>
<tr>
<td>02/22/83</td>
<td>53/83</td>
<td>EPL Coronal Transient</td>
<td>1927-2000</td>
<td>90-100</td>
<td>1.3</td>
<td>05-83</td>
<td>V67290</td>
</tr>
<tr>
<td>03/09/83</td>
<td>68/83</td>
<td>EPL Depletion Transient</td>
<td>2030-2130</td>
<td>100</td>
<td>1.25</td>
<td>05-83</td>
<td>V67294</td>
</tr>
<tr>
<td>03/13/83</td>
<td>72/83</td>
<td>Coronal Transient</td>
<td>1830-1900</td>
<td>260-270</td>
<td>06-83</td>
<td>V67293</td>
<td>V67295</td>
</tr>
<tr>
<td>05/01/83</td>
<td>121/83</td>
<td>Coronal Transient Faint</td>
<td>2104-2112</td>
<td>190</td>
<td>1.2</td>
<td>09-83</td>
<td>V67303</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EPL Faint Coronal Transient</td>
<td>2100-2140</td>
<td>210-240</td>
<td>09-83</td>
<td>V67304</td>
<td>V67305</td>
</tr>
<tr>
<td>05/07/83</td>
<td>127/83</td>
<td>EPL Small EPL in Clouds</td>
<td>2024-2048</td>
<td>115</td>
<td>1.1</td>
<td>09-83</td>
<td>V67308</td>
</tr>
<tr>
<td>05/21/83</td>
<td>141/83</td>
<td>Coronal Transient</td>
<td>2050-2115</td>
<td>230-300</td>
<td>10-83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>05/29/83</td>
<td>149/83</td>
<td>EPL No Coronal Transient Seen</td>
<td>2030-2100</td>
<td>138</td>
<td>1.1</td>
<td>10-83</td>
<td>V67317</td>
</tr>
<tr>
<td>DATE</td>
<td>DOY</td>
<td>ACTIVITY</td>
<td>TIME</td>
<td>PA</td>
<td>RV</td>
<td>MLSO FILM #</td>
<td>MAG TAPE #</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>---------------------------------------</td>
<td>------------</td>
<td>------</td>
<td>-----</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>06/17/83</td>
<td>168/83</td>
<td>EPL</td>
<td>1800-2015</td>
<td>113-137</td>
<td>1.17</td>
<td>11-83</td>
<td>V67323</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67324</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67325</td>
</tr>
<tr>
<td>06/22/83</td>
<td>173/83</td>
<td>Coronal Enhancement Peaking at 120 PA</td>
<td>1840-2200</td>
<td>110-120</td>
<td>1.1</td>
<td>12-83</td>
<td>V67327</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67328</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67329</td>
</tr>
<tr>
<td>06/24/83</td>
<td>175/83</td>
<td>EPL</td>
<td>2235-2354</td>
<td>80</td>
<td>1.17</td>
<td>12-83</td>
<td>V67330</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67331</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67332</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67333</td>
</tr>
<tr>
<td>06/28/83</td>
<td>179/83</td>
<td>Coronal Depletion with no</td>
<td>1943-2010</td>
<td>219-277</td>
<td>1.2</td>
<td>13-83</td>
<td>V67342</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Noticeable Prominence Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67343</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67344</td>
</tr>
<tr>
<td>06/29/83</td>
<td>180/83</td>
<td>EPL</td>
<td>1818-1915</td>
<td>280-286</td>
<td>1.2</td>
<td>13-83</td>
<td>V67346</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67347</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67348</td>
</tr>
<tr>
<td>07/01/83</td>
<td>182/83</td>
<td>EPL</td>
<td>1940-2100</td>
<td>113-118</td>
<td>1.45</td>
<td>13-83</td>
<td>V67345</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Twist Loop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67349</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Coronal Changes seen except for</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67350</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slight Enhancement at Limb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V67351</td>
</tr>
<tr>
<td>07/05/83</td>
<td>186/83</td>
<td>Surge/Spray</td>
<td>1821-2116</td>
<td>110</td>
<td>1.3</td>
<td>13-83</td>
<td>V67345</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surge</td>
<td>1821-1846</td>
<td></td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surge</td>
<td>1855-1926</td>
<td></td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spray</td>
<td>2048-2116</td>
<td></td>
<td>1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Coronal Changes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>DOY</td>
<td>ACTIVITY</td>
<td>TIME</td>
<td>PA</td>
<td>RV</td>
<td>MLSO FILM #</td>
<td>MAG TAPE #</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>---------------------------</td>
<td>----------</td>
<td>--------</td>
<td>----</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>08/25/83</td>
<td>237/83</td>
<td>EPL</td>
<td>1750-2200</td>
<td>120-145</td>
<td>1.5</td>
<td>17-83</td>
<td>V67358</td>
</tr>
<tr>
<td>09/02/83</td>
<td>245</td>
<td>Active Region EPL</td>
<td>1843-2124</td>
<td>47-112</td>
<td>1.5</td>
<td>17-83</td>
<td>V67360</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ejected Material Looped</td>
<td>1851-1956</td>
<td>53-60</td>
<td>1.2</td>
<td></td>
<td>V67361</td>
</tr>
<tr>
<td></td>
<td></td>
<td>over and fell back into</td>
<td>1911-2000</td>
<td>75-85</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photosphere at PA 90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slight Depletion Detected</td>
<td>1843-2049</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/03/83</td>
<td>246</td>
<td>Active Prominence Loop</td>
<td>1750-2200</td>
<td>120-145</td>
<td>1.6</td>
<td>17-83</td>
<td>V67359</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some Slow Changes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/29/83</td>
<td>302</td>
<td>HALPHA Activity Loops</td>
<td>2010</td>
<td>120-130</td>
<td>1.1</td>
<td>21-83</td>
<td>V67367</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surge</td>
<td>2055</td>
<td>110</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HALPHA Activity Dissipated</td>
<td>2200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Coronal Changes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/22/83</td>
<td>326</td>
<td>Small EPL</td>
<td>2050-2150</td>
<td>298-302</td>
<td>1.2</td>
<td>22-83</td>
<td>V67369</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material Slowly Rose Up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Disintegrated, Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very Bright</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Coronal Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>