SOLAR, GEOMAGNETIC, IONOSPHERIC AND OZONE DATA

KODAIKANAL SOLAR, GEOMAGNETIC AND IONOSPHERIC DATA
(October—December 1959)

Curves showing (a) Kodaikanal daily relative sunspot numbers, (b) daily areas of calcium prominences and (c) daily areas of H-alpha dark markings are given on p. 195. Tables 1 to 4 below summarise the data on solar and geomagnetic phenomena. The hourly median values of critical frequency and virtual height for the ionospheric layers are given in Table 5.

### TABLE 1
Prominent sunspot groups

<table>
<thead>
<tr>
<th>Kodaikanal serial No. of spotgroup</th>
<th>Mean latitude</th>
<th>Date of central meridian passage</th>
<th>Total area (millionths of the Sun’s visible hemisphere at central meridian passage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11688</td>
<td>19° S</td>
<td>Nov 11</td>
<td>925*</td>
</tr>
<tr>
<td>11699</td>
<td>15° N</td>
<td>Nov 26</td>
<td>519**</td>
</tr>
<tr>
<td>11705</td>
<td>5° N</td>
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<td>1232†</td>
</tr>
<tr>
<td>11708</td>
<td>7° N</td>
<td>Dec 5</td>
<td>1008</td>
</tr>
<tr>
<td>11716</td>
<td>18° N</td>
<td>Dec 15</td>
<td>901</td>
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* Area as measured on 10 November 1959. ** It was larger in area before central meridian passage. † Area as measured on 3 December 1959.

### TABLE 2
Solar Flares

<table>
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<tr>
<th>Date</th>
<th>Time in GMT</th>
<th>Co-ordinates</th>
<th>Importance</th>
<th>H-alpha line width</th>
<th>Remarks</th>
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<tr>
<td></td>
<td>Beg.</td>
<td>Max.</td>
<td>End.</td>
<td>Mean latitude</td>
<td>Mean longitude</td>
</tr>
<tr>
<td></td>
<td>h</td>
<td>m</td>
<td>h</td>
<td>m</td>
<td>m</td>
</tr>
<tr>
<td>Oct 7</td>
<td>05</td>
<td>00*</td>
<td>—</td>
<td>05</td>
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</tr>
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<td>Dec 4</td>
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<td>45</td>
<td>08</td>
<td>55</td>
<td>09</td>
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* Time of commencement of observation and not beginning of flare
TABLE 3
Sudden disappearances of prominences and H-alpha dark markings

No sudden disappearance of prominences and H-alpha dark markings was observed

TABLE 4
Principal magnetic storms

<table>
<thead>
<tr>
<th>Greenwich date</th>
<th>Storm-time</th>
<th>Sudden commencement</th>
<th>C-figure degree of activity</th>
<th>Maximal activity</th>
<th>Ranges</th>
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<tbody>
<tr>
<td></td>
<td>GMT of beginning</td>
<td>GMT of ending</td>
<td>Type</td>
<td>Amplitude</td>
<td></td>
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<td>h  m  d  h</td>
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<td>D  H  Z</td>
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<td>07</td>
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<td>52</td>
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<td>06</td>
<td>57</td>
<td>7</td>
<td>05</td>
<td>s.c.</td>
</tr>
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</table>

The following symbols and conventions have been used according to recognised practice—

1. Approximate time of ending of storm construed as the time of cessation of reasonably marked disturbance movements in the traces

2. s.c. = sudden commencement  
... = gradual commencement

3. Signs of amplitudes of D and Z taken algebraically;
   (D — reckoned negative being westerly)
   (Z — reckoned positive being vertically downwards)

4. Storm described by three degrees of activity;
   m — for moderate (when range is less than 250γ)
   ms — for moderately severe (when range is between 251γ and 400γ)
   s — for severe (when range is above 400γ)
TABLE 5

Ionospheric data (Median values)

<table>
<thead>
<tr>
<th>Kodaikanal (10-2°N, 77-5°E)</th>
<th>November 1959</th>
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<tr>
<td>Time [h] F2 foF2 h'F h'F1 h'E foE foEs (M3000)</td>
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Ionospheric data (Median values)

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<tr>
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Kodaikanal Observatory, Kodaikanal
30 January 1960

A. K. DAS
Deputy Director General of Observatories

The symbols and terminology used are in accordance with the recommendations of the Special Committee on World-wide Ionospheric Soundings to U.R.S.I. A.G.I. in its first report (Brussels, 2 September 1956).
Fig. 1 (a). Kodaikanal daily relative sunspot numbers

Fig. 1 (b). Daily areas of calcium prominences

Fig. 1 (c). Daily areas of H-alpha dark markings

Note: Breaks in the graphs are due to lack of observations.
### SOLAR GEOMAGNETIC IONOSPHERIC AND OZONE DATA

**MAGNETIC OBSERVATORY, ALIBAG (BOMBAY)**

Three-hourly indices of Geomagnetic Activity

(Scale values of variometers in γ/mm: D = -11.3; H = -4.4; Z = -2.5)

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<td>3545</td>
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</table>

* At Bombay, since 1883, a day is classed as (1) a quiet day, or a day of (2) small, (3) moderate, (4) great or (5) very great disturbance, the letters distinguishing the respective classes being Cs, M, G and VG. For representing intermediate conditions of activity of the smaller period movements, sub-classifications, Ca, Sa, and Ma are used. Roughly speaking a storm having a range over 225γ in the variations of the horizontal intensity during the first twenty-four hours after its commencement is classed as "Very Great". It is "Great" if the range is between 150γ and 225γ, "Moderate" if the range is between 65γ and 150γ, "Small" if the range is less than 65γ. The range is however not the only criterion used in assigning the character of a storm. The oscillations in the magnetograms are duly taken into account in determining the character or class to which a particular storm should belong.

The corresponding international character figures can be determined from the following—

<table>
<thead>
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<th>Bombay Character</th>
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<th>Bombay Character</th>
<th>International Character</th>
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Colaba, Bombay
29 January 1960

P. R. PISHAROTY
Director, Colaba and Alibag Observatories
# Solar Geomagnetic Ionospheric and Ozone Data

## Daily Ozone Data—India

(From direct sun observations on 3112/3323 Å and 4536/3323 Å)

Assumed \( \alpha (3112) = 1.233 \) and \( \alpha' (3323) = 0.071 \)

**New Delhi**

(Lat. 28° 35'N, Long. 77°12'E)

<table>
<thead>
<tr>
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<th>October 1959</th>
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<th>November 1959</th>
<th></th>
<th>December 1959</th>
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<td>Hours Ozone (IST) amount (cm-atmos)</td>
<td>State of sky</td>
<td>Hours Ozone (IST) amount (cm-atmos)</td>
<td>State of sky</td>
<td>Hours Ozone (IST) amount (cm-atmos)</td>
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**Note**—The cloud amounts are in oktas.
### DAILY OZONE DATA — INDIA

(From direct sun observations on 3112/3323 Å and 4536/3323 Å)

Assumed x (3112) = 1.233 and x′ (3323) = 0.071

MT. ABU

(Lat. 24° 36' N, Long. 72° 43' E)

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**Note**—The cloud amounts are in oktas.
SOLAR GEOMAGNETIC IONOSPHERIC AND OZONE DATA

DAILY OZONE DATA — INDIA
(From direct sun observations on 3112/3323 Å and 4536/3323 Å)
Assumed α (3112) = 1.23 and α' (3323) = 0.08

KODAIKANAL
(Lat. 10° 14' N, Long. 77° 28' E)

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Note — The cloud amounts are in oktas
**SOLAR GEOMAGNETIC IONOSPHERIC AND OZONE DATA**

**DAILY OZONE DATA — INDIA**

(From direct sun observations on 3112, 3323 Å and 4536/3323 Å)

Assumed $x$ (3112) = 1.233 and $x'$ (3323) = 0.071

**SRINAGAR**

(Lat. 34°05’ N, Long. 74°56’ E)

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**Note**—The cloud amounts are in oktas
# Solar Geomagnetic Ionospheric and Ozone Data

## Daily Ozone Data—India

(From direct sun observations on 3112/3232 Å and 4536/3323 Å)

Assumed α (3112) = 1.233 and α' (3323) = 0.071

**Srinagar**

(Lat. 34°05'N, Long. 74°50'E)

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**Note**—The cloud amounts are in oktas.