Infrared Solar Spectrum Observed from a Balloon-Borne Spectrometer
Between 9300 and 11000 Å and Between 12000 and 19000 Å

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This research was sponsored by the Advanced Research Projects Agency
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Contract Monitor: Robert McClatchey
Optical Physics Laboratory

Prepared for
Air Force Cambridge Research Laboratories
Office of Aerospace Research
United States Air Force
Bedford, Massachusetts 01730

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ABSTRACT

Records are presented of the infrared solar spectrum in the 0.9 - 1.1μ and 1.2 - 1.9μ regions, observed from altitudes up to 30 km, with a resolution of 0.5μ. The spectra show many new solar absorption lines which appear only at high altitude records, where the telluric absorptions are eliminated.
SUMMARY

This report completes the presentation of the results obtained during the balloon flight performed August 7, 1967. The flight details were described in a separate report. During this flight, high altitude atmospheric transmittance data was obtained, using the sun as the source. The spectral region scanned was from 1 to 2μ, with a resolution of ~0.5Å.

Partial results from this flight were presented in previous publications, which included a few representative lines in the 1-2μ region\(^{(2)}\) and the complete data obtained in the 1.1μ region\(^{(3-4)}\)(10800 - 12150Å). The present report completes the data in the 1-2μ region. The results are presented in the form of an atlas, following similar procedures to those described in Ref. 2-3. The Michigan atlas,\(^{(5-6)}\) the Arizona-NASA atlas,\(^{(7-8)}\) the Jungfraujoch atlas\(^{(9-10)}\) and recently calculated line intensities and positions\(^{(4)}\) were used for line identifications.

ACKNOWLEDGMENTS

Acknowledgement is made to the National Center for Atmospheric Research which is sponsored by the National Science Foundation, for use of its Control Data 6600 Computer.

Our thanks to Charles Garwood, Steve Smith and John Van Allen for valuable assistance on the data reduction.
REFERENCES


DEFLECTION

WAVELENGTH (Å)

FIG 2 SEC 1
DEFLECTION

WAVELENGTH (Å)

FIG 2 SEC 7
FIG. 2. SEC A.

WAVELENGTH (Å)

DEFLECTION

0

12000

17500

18000
DEFLECTION

WAVELENGTH (Å)

FIG 2 SEC 46
FIG 2 SEC 47

WAVELENGTH (Å)

DEFLECTION

10036.5 Fe X
DEFLECTION

WAVELENGTH (Å)
## TABLE I

Times and Altitudes for the Selected Records Shown in Figures 1-2.

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<td>24.5 - 36.5</td>
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<tr>
<td>8</td>
<td>7:46 - 8:04</td>
<td>36.5 - 52.0</td>
</tr>
<tr>
<td>9</td>
<td>8:04 - 8:22</td>
<td>52.0 - 62.0</td>
</tr>
<tr>
<td>11</td>
<td>8:40 - 8:58</td>
<td>75.3 - 87.0</td>
</tr>
<tr>
<td>12</td>
<td>8:58 - 9:16</td>
<td>87.0 - 96.0</td>
</tr>
<tr>
<td>13</td>
<td>9:16 - 9:34</td>
<td>96.0 - 96.3</td>
</tr>
<tr>
<td>14</td>
<td>9:34 - 9:52</td>
<td>96.3 - 96.3</td>
</tr>
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