PROBABLE EXCESS OF LITHIUM IN THE ATMOSPHERE OF THE MAGNETIC STAR $\beta$ CORONAE BOREALIS

ROSANNA FARAGGINA AND MARGHERITA HACK
Osservatorio Astronomico
Merate, Italy

Four spectrograms of $\beta$ Coronae Borealis (F0p) taken with the grating spectrograph of the Merate Observatory, at a dispersion of 35 Å/mm, show a moderately strong line at $\lambda$ 6708. The only possible identification is that with the resonance doublet of Li I at $\lambda$ 6707.74 and $\lambda$ 6707.89. Table I gives the equivalent widths of the Li I line and, for comparison, those of a blend of Gd II and Fe I at $\lambda$ 6704.5.

**TABLE I**

<table>
<thead>
<tr>
<th>Plate</th>
<th>Date (UT)</th>
<th>$W_{6708}$</th>
<th>$W_{6704.5}$</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 1680</td>
<td>May 5.98</td>
<td>0.21</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>H 1695</td>
<td>16.85</td>
<td>(0.31)</td>
<td>(0.45)</td>
<td>defective plate</td>
</tr>
<tr>
<td>H 1696</td>
<td>16.89</td>
<td>0.15</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Fa 1700</td>
<td>17.05</td>
<td>0.16</td>
<td>0.30</td>
<td></td>
</tr>
</tbody>
</table>

Using the solar curve of growth, with $\log c/\nu = 5.16^1$ and the curve of growth for $\beta$ Coronae Borealis$^2$ with $\log c/\nu = 4.85$ and assuming $-\log W/\nu$ (sun) $= 6.52^3$, we find that the total abundance of lithium in the atmosphere of $\beta$ Coronae Borealis is at least 1000 times higher than in the solar atmosphere. The lower limit is obtained by reducing the measured equivalent width for Li I by a factor of two in order to allow for possible errors due to the relatively low dispersion. This result confirms the hypothesis proposed by Fowler, Burbidge, and Burbidge$^4$ that light elements like deuterium, lithium, beryllium, and boron might be produced by a spallation process in the atmospheres of the magnetic stars. Another proof of this hypothesis has been recently given by the observations of Sargent, Searle, and Jugaku$^5$ that beryllium is probably overabundant by a factor of 100 in the atmospheres of the magnetic stars.

Observations of several magnetic stars in the $\lambda$ 6700 region of the spectrum are in progress.
NOTES FROM OBSERVATORIES


Editor's note: This paper was received prior to publication of an abstract on the same subject by G. Wallerstein, G. H. Herbig, and P. Conti (AJ., 68, 298, 1963).