

SPECTROSCOPIC NOTES : I. HD 133738 and HD 6882

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During the past years a number of spectra of southern objects have been taken by the authors and their collaborators at the Bosque Alegre station of the Córdoba Observatory.

In the present series of notes, certain interesting objects will be described. It is hoped that other colleagues having access to higher dispersion than ours (42 Å/m) will undertake an extension of these short descriptions.

HD 133738

This object is classified in the HD catalogue as B5; Feast, Thackeray and Wesselink¹⁾ remark that "the H lines are bright and double on diffuse absorptions. Fe II emission lines are probably present". Two plates, covering the wavelength region $\lambda\lambda$ 3400-4800 were obtained on March 10 and 14, 1960. The spectrum is characterized by the following features.

- 1) The hydrogen lines are well visible up to $n=14$ and probably up to $n=18$. $H\beta$ shows a broad emission, about 500 km/sec wide, with a sharp central absorption, both sides being of equal intensity. The peaks of the red and the violet component are separate by 160 km/sec. $H\gamma$, $H\delta$ and $H\epsilon$ are wide and shallow with emission peaks which tend to lie slightly to the red. From $H\zeta$ on, the lines are broad with a sharp core.
- 2) HeI is well represented and shows the normal aspect for this spectral type. The lines are very broad and show probable emission in the strongest lines of the 3D series, slightly redwards of the center. Very noticeable is the dilution effect in the metastable lines visible in the blue, $\lambda\lambda$ 3888 and 3964.
- 3) Both the appearance of the hydrogen and the helium lines is best explained by a shell superposed upon a normal spectrum. Very probably the shell is also responsible for the apparent emissions in the helium lines; one of the components is due to the star and the other to the shell, so that an apparent emission is formed between both lines.

4) The approximate spectral type of the shell is about B9-A0, as given by the intensity of $\lambda 4481$. Several other lines corresponding to Si and Ti II are seen, and probably also lines of Mn and FeII. The spectral type of the sublying star is about B3 or B4.

5) The radial velocity of the 15 best lines gives -17 ± 8 km/sec. The only exception is constituted by the HeI lines of the 3D series, which gives a mean velocity of $+95$ km/sec. It can be added that the velocity of the higher Balmer lines tends to give a larger negative value than $H\beta$.

HD 6882 = ζ Phoenicis

This object is a double line spectroscopic binary and also an eclipsing binary. According to A. de Vaucouleurs, quoted by Hagemann²⁾ the spectrum of the main component is B6V and the one of the secondary, A0V. This last one is really a computed type and not an observed one. According to Hagemann, the quality of the lines for radial velocity determinations is poor, the lines of He and Mg being faint and diffuse.

Two plates of the object were taken on October 9 and November 8, 1960, covering the wavelength range $\lambda\lambda 3450-4700$. The observed features are summarised as follows:

- 1) The spectral type of the primary is about B7 V. The Balmer lines, visible up to $n=16$, are perhaps too narrow for dwarf, and a luminosity class IV would fit better.
- 2) HeI is about normal for the type, but the lines are slightly hazy. Other elements like Si and Mg are normal too.
- 3) The most unusual feature in the spectrum is the presence of P II, which is very strong and well represented. The following lines are seen:

<u>λ</u>	<u>Mult.</u>	<u>Lab.Int.</u>
3472	2	5
3503	2	5
3507	18	6
3664	18	6
3715	1	4
3768	1	4
4475	24	7
4499	11	7
4530	25 + 35	7
4587	15 + 35	8
4589	24	8
4601	15	8

From the table it can be concluded that all lines in Miss Moore's table whose laboratory intensity is larger than 4, are visible.

Up to now, this is the fifth star known to show enhanced phosphorus, the others being 3 Cen (B3), 112 Her, α and * Cno (the last three peculiar stars of the manganese type).

4) On our plates, no lines due to the secondary component are seen.

Bibliography

1. M.W.Feast, A.D.Thackeray, A.J.Wesselink. Mem.Roy.Astr.Soc. 68, p.I (1957).
2. G.Hagemann, Monthly Notices, 119, 143 (1959).