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SPECTROSCOPY OF THE B[e] STAR HD 50138 (MWC 158)

A recent paper by Jaschek *et al.* (1992) draws attention to recent changes in the spectrum of the B[e] star HD 50138 (MWC 158). In addition to profile and equivalent width variations of the hydrogen lines, HD 50138 also exhibits strong and variable emission in the Ca II infrared triplet, a variable O I 7774 Å absorption/emission feature, and variable N I emission lines near 8700 Å. HD 50138 has been grouped with HD 45677, since both stars show infrared excesses and have similar emission line characteristics. Near the end of 1990 HD 50138 apparently began a new shell phase, when the O I 7774 Å line developed an inverted P Cygni profile, and the V/R ratio for the Paschen lines showed a marked change from what was seen a year before.

HD 50138 has been spectroscopically monitored at Ritter Observatory since 1987. Usually the H α profile has been observed with our echelle spectrograph and CCD detector, but we have obtained a few observations of the Na I D-line region and the Ca II infrared triplet as well. We can confirm the emission line variability noted by other observers, noting that dramatic profile changes can be seen to occur on timescales as short as one week.

In this note, we wish to draw attention to the spectrum of HD 50138 in the D-line region, which has thus far received little comment in the literature. Figure 1 is a CCD scan of the region of the Na I D-lines and He I 5876 Å obtained on 10 April 1991, a few months after the start of the outburst reported by Andrillat and Houziaux. The He I line at 5876 Å shows an inverse P Cyg profile, similar to what was seen at the O I 7774 Å line in December 1990 (Jaschek *et al.* 1992). The velocity separation of the emission/absorption components of the He I line is 200 km/s, compared with a value of about 300 km/s for the O I components in December 1990. The D-lines in HD 50138 are remarkable, with two

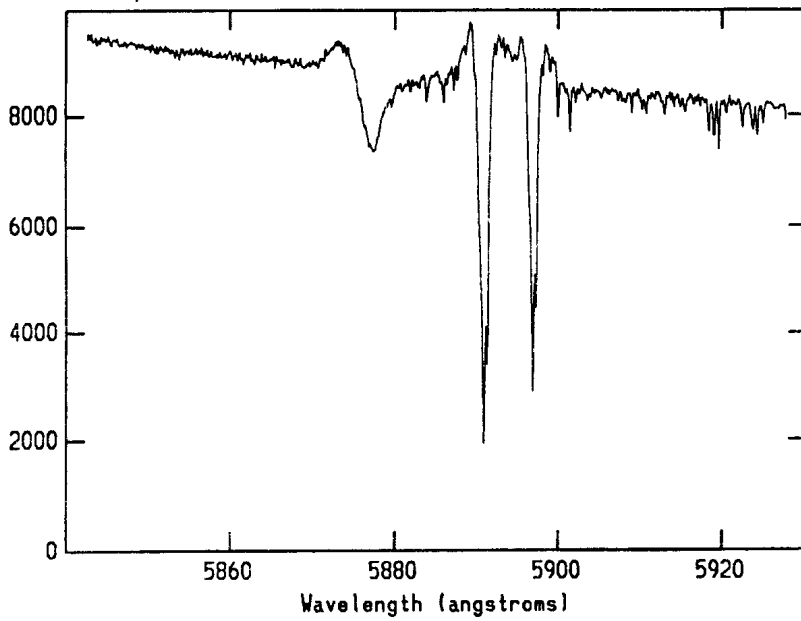


Figure 1: The Na I D-line region of HD 50138 on 10 April 1991 UT.

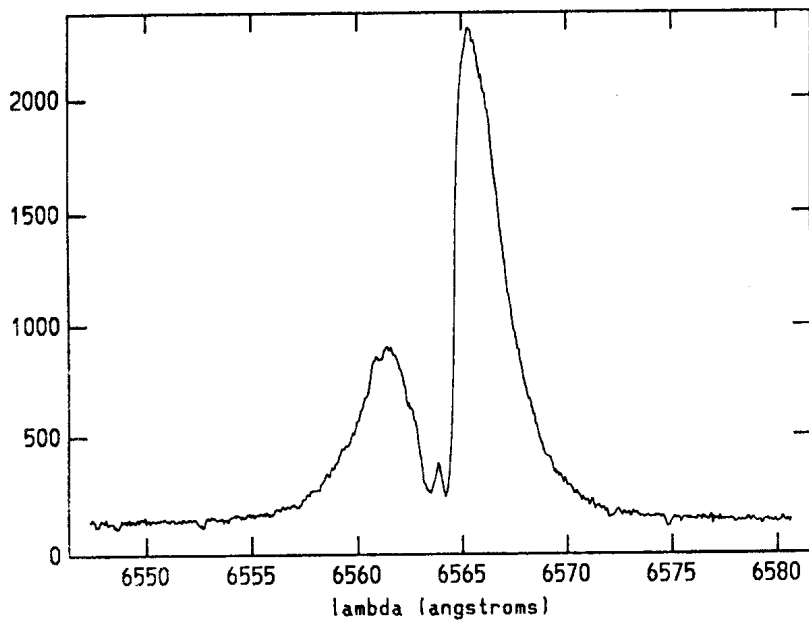


Figure 2: The H α region of HD 50138 on 22 March 1991 UT.

strong, narrow absorption components superimposed on broad emission. The D-line absorptions are circumstellar, rather than interstellar, since one earlier (1990) echelle scan shows quite different line depths. The two D-line components have velocities of +38 and +18 km/s (this may be compared with the +34 km/s value for the velocity of HD 50138 given by the GCRV). All observations of this region that we obtained in 1992 are of lower (1 Å) resolution, but are adequate to show that the inverse P Cyg emission component of He I has apparently vanished, leaving a strong absorption line.

In contrast, changes in the H α profile during 1990-92 have been small. Figure 2 is an H α scan of HD 50138 obtained at Ritter on 22 March 1991, three months after the detection of the shell episode. Comparison of this figure with the profiles illustrated by Halbedel (1991) and Dachs, Hummel, and Hanuschik (1992) obtained in 1987 and 1988, respectively, show only small differences, some of which may be the result of differing spectral resolutions.

More intensive observations of the H α and D-line regions at high resolution will take place at Ritter Observatory during 1993.

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REFERENCES

- Andrillat, Y., and Houziaux, L. 1991, IAU Circular No. 5164
- Dachs, J., Hummel, W., and Hanuschik, R. W. 1992, Astron. Astrophys. Suppl. **95**, 437.
- Halbedel, E. 1991, Inf. Bull. Var. Stars, No. 3585.
- Jaschek, M., Jaschek, C., Andrillat, Y., and Houziaux, L. 1992, Mon. Not. R. Astron. Soc. **254**, 413.