

Magnetic fields in hot subdwarfs

V.G. Elkin

Special Astrophysical Observatory of the Russian AS, Nizhnij Arkhyz 357147, Russia

Abstract.

The hot subdwarfs are a group of stars which lie to the left of the upper main sequence in the H-R diagram. There are three groups of hot subdwarfs, distinguished by characteristic temperatures and helium abundances. The sdB and sdOB stars are helium deficient, with mean effective temperatures of $24000 \text{ K} \leq T_{\text{eff}} \leq 42000 \text{ K}$, and large surface gravities $5.0 < \log g < 6.0$. The group of sdO stars have helium rich atmospheres, temperatures $T_{\text{eff}} > 35000 \text{ K}$ and surface gravities $4.0 < \log g < 6.5$.

We present new longitudinal magnetic field measurements of two hot subdwarfs. From circularly polarized spectra obtained at the 6 m telescope we infer magnetic fields of $B^e = -1680 \pm 120 \text{ G}$ in the sdO subdwarf BD+75°325 and a variable field in the sdOB subdwarf BD+25°2534, with extrema of -1300 G and +1750 G.

In Figs. 1 and 2 we present representative Zeeman spectra of BD+75°325 and BD+25°2534. As can be seen, the Zeeman shifts between the left and right circularly polarized spectra are quite large and unambiguous. The solid lines are right circular polarization, and dashed lines are left circular polarization. The reality of these results is confirmed by observations well known magnetic star 53 Cam and the non-magnetic standard *o* UMa. Representative spectra of 53 Cam are shown in Fig. 3.

Fig. 4 shows the systematic shift in the line centres of gravity for our non-magnetic standard *o* UMa.

The complete paper was published in *Astron. Astrophysics* Vol. 312, L5-L8 (1996).

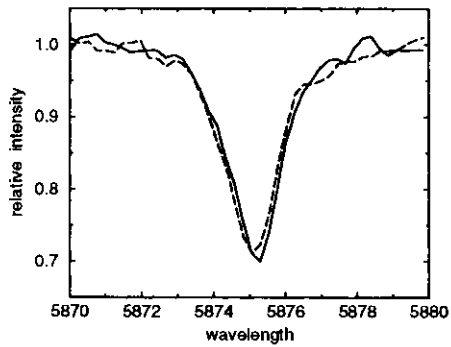


Figure 1: Helium line profiles of BD+25°2534. *solid line* - right circular polarization, *dashed line* - left circular polarization.

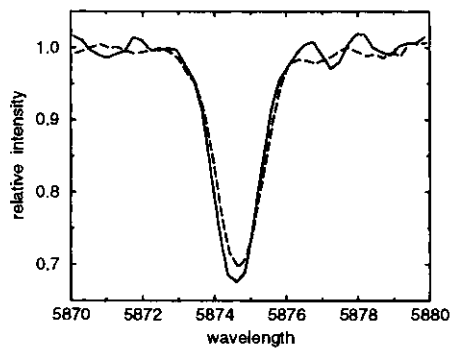


Figure 2: Helium line profiles of BD+75°325. Designations are the same as in Fig. 1.

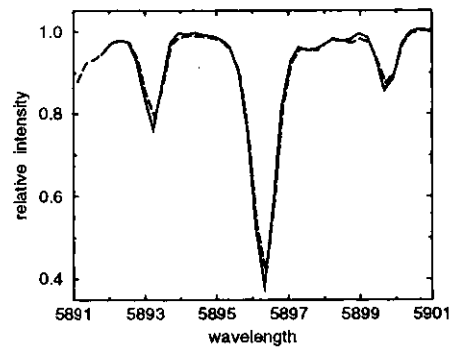


Figure 4: A part of the spectrum of the zero-field standard star o UMa. Designations are the same as in Fig. 1.

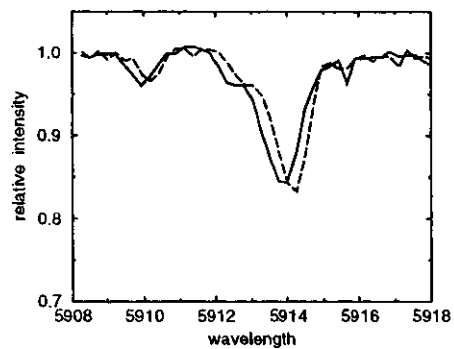


Figure 3: A part of the spectrum of the magnetic star 53 Cam. Designations are the same as in Fig. 1.