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FAST VARIATIONS OF ε AURIGAE

The spectral variability of the F supergiant star of the ε Aurigae binary system has been known for a long time (Ludendorff (1906), Wright (1955), Hack (1958)). The change in the shapes of the lines was always observed in spectra obtained at different epochs or during different nights. We have also observed variations in spectra obtained on the same night with a time difference of about 15^m. The spectra used are listed in Table 1. They were obtained with the Coude spectrograph of the 152 cm telescope of the Haute Provence Observatory. The dispersion of all the spectra is 7.5 Å/mm and the quality of the spectrograms is very good.

The equivalent width variation between GC 105 and GC 107 and between GC 117 and GC 118 is shown in Fig. 1a,b. Both in GC 107 and GC 118 the equivalent widths are stronger than in GC 105 and in GC 117,respectively. A slight variation between GC 111 and the other spectra obtained on the same night is also suspected (Fig.1c). No variations are observed between GC 105, GC 110, GC 112, GC 117, GC 119. The plots concerning these spectra are all similar to that in Fig.1d. In the red region we also observe slight variations of equivalent width during the same night for lines with remarkable line profile variations. The variability of the shape of the line profiles is more or less evident in all the spectra. Some blends are resolved in some spectra and not in others. An example is the blend of YII(22),λ 4900.13 and BaII(3),λ 4489.93. The two lines are well separated only in GC 117 (Fig.2). We have not observed radial velocity variations corresponding to line intensity variation.

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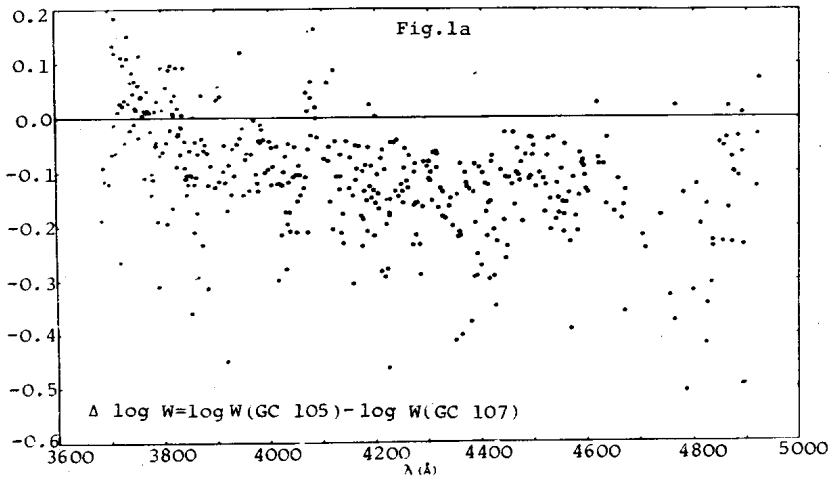
References:

Hack M., 1959, Astroph.J. 129, Vol.2, 291
Ludendorff H., 1906, Astron. Nachrichten 171, 4
Wright K.O., 1955, R.A.S.C. Jour. 49, N.6, 221

Table 1

The spectrograms

Plate No.	Date	Hour	Spectral region (Å)	
GC 105	11. 2.1971	24^h07^m	3600	4940
GC 107	11. 2.1971	24 23	"	"
GC 110	12. 2.1971	22 05	"	"
GC 111	12. 2.1971	22 11	"	"
GC 112	12. 2.1971	22 28	"	"
GC 117	14. 2.1971	21 09	"	"
GC 118	14. 2.1971	21 19	"	"
GC 119	14. 2.1971		"	"
GC 120	14. 2.1971	22 01	4800	6750
GC 121	14. 2.1971	23 13	"	"



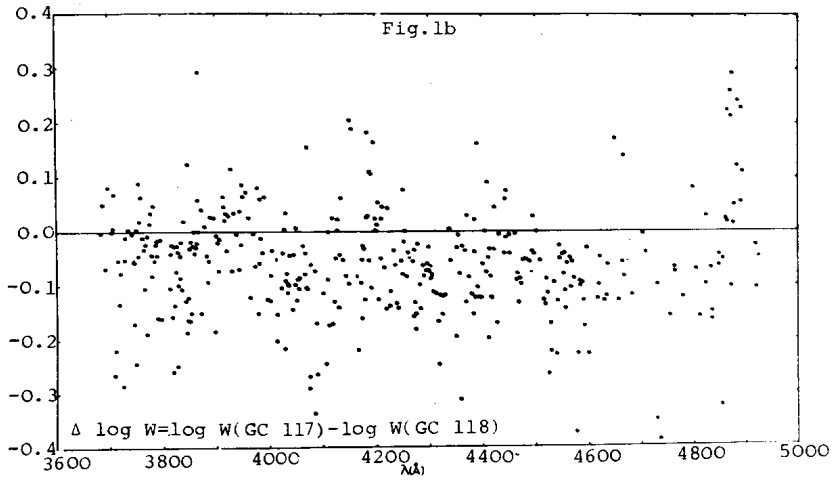


Fig.1b
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
Δ log W=log W(GC 117)-log W(GC 118)
3600
3800
4000
4200
4400
4600
4800
5000
λ(Å)

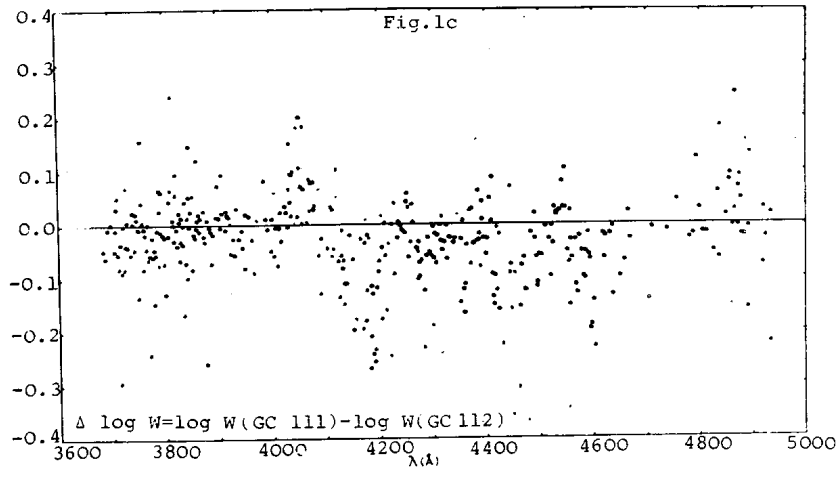


Fig.1c
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
Δ log W=log W(GC 111)-log W(GC 112)
3600
3800
4000
4200
4400
4600
4800
5000
λ(Å)

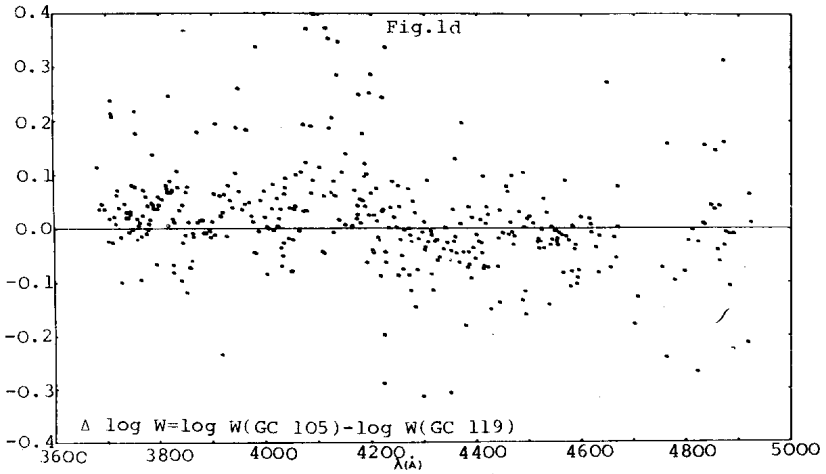
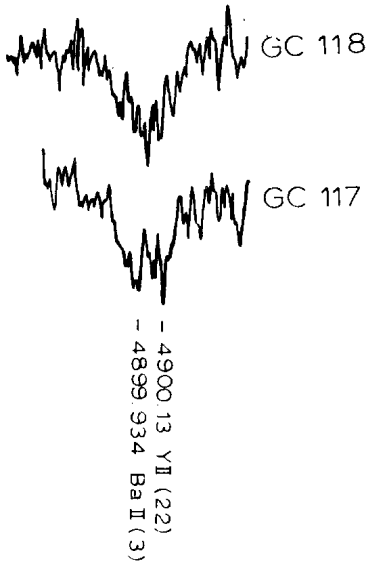


Fig.1d
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
Δ log W=log W(GC 105)-log W(GC 119)
3600
3800
4000
4200
4400
4600
4800
5000
λ(Å)

Fig.2


GC 118
GC 117
4900 13 YII (22)
4899 934 BaII (3)