

Be STARS IN OPEN CLUSTERS

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RESUMEN. Se presentan resultados sobre las características de 124 estrellas en 52 cúmulos abiertos.

ABSTRACT. The characteristics of 124 Be stars in 52 open clusters are presented.

Key words: CLUSTERS-OPEN — STARS-Be

From a survey in the literature of the spectral classification of stars in open clusters we have selected 124 emission-line stars classified as Be stars. They belong to 52 clusters which have data in the UBV system. The location of the Be stars in the observed color-color and color-magnitude diagrams were already presented (Feinstein, 1987). The corrected distance modulus and excess color, $E(\text{cluster})$, as given in the cluster data are also included. With these values intrinsic colors $(B-V)_0$ and $(U-B)_0$ are obtained (Figure 1). It is noted that mostly of them are above the main sequence. On the other hand, other intrinsic colors $(B-V)_0$ and $(U-B)_0$ for the same stars, are computed derreddening each star to the main sequence. This gives the possibility to compute another excess color, $E(\text{comp})$. Figure 1 shows that brighter the emission-line stars, greater is the additional color excess due to the interstellar envelope, where the maximum value amounts to about 0.20 mag.

The relation of the color excess of the cluster $E(\text{cluster})$ versus the computed color excess $E(\text{comp})$ confirms clearly the additional color excess due to a circumstellar envelope (Figure 2), which would permit us to get its value for each particular star.

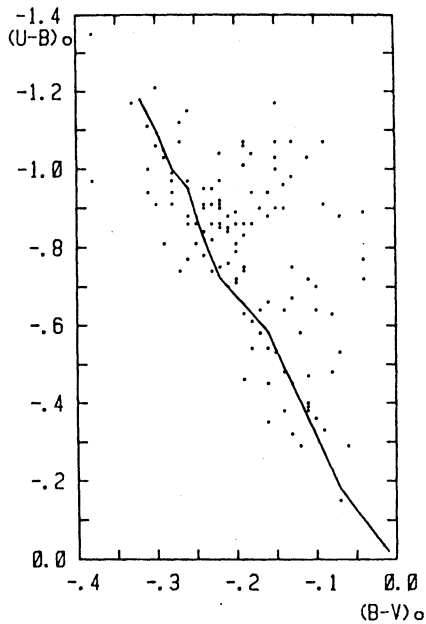


Figure 1. The intrinsic color-color diagram for Be stars in open clusters

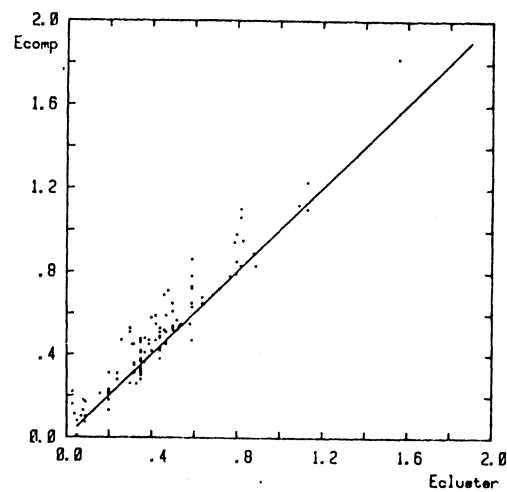


Figure 2. The color excess of the cluster $E(\text{cluster})$ vs the color excess of each star $E(\text{comp})$.

The number of Be stars related to their spectral types is given in Figure 3. A maximum number of Be-stars is presented for type B2, which is the same as already given for the field stars.

The distribution of Be-type stars according to the age of the clusters as listed by Lyngå (1985) suggests a maximum distribution for about 10^7 years (Figura 4). In the figure each symbol above blanks means the number of Be stars in each cluster.

It is interesting to mention that NGC 6530 is the open cluster with 18 Be stars, the largest number of bright Be stars known to be members of a single cluster. The spectral classification was derived by Hiltner et al (1965). To check how many of them would be real Be stars we look in the literature for those stars displaying variable photometric data. Stars Nos. 35, 58, 65 and 66 are the only which suggest to be emission line stars (Table 1).

The complete list of Be stars in open clusters becomes available upon request.

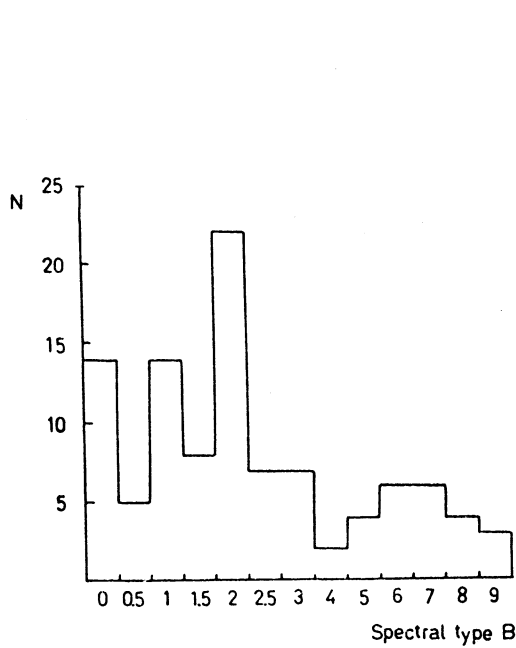


Figure 3. The number of Be stars for each spectral type.

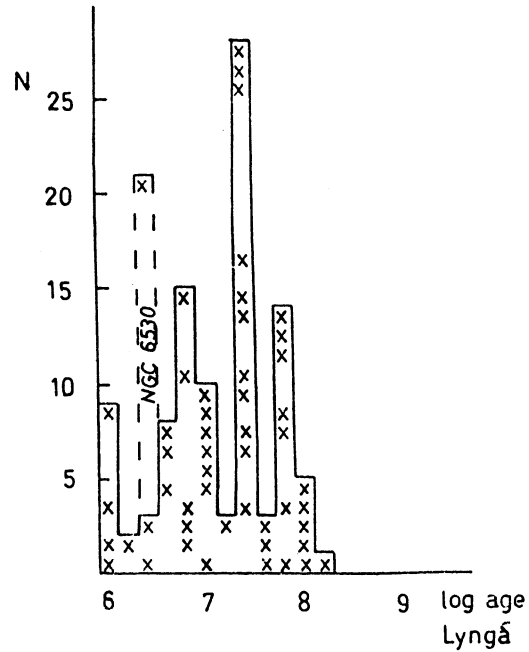


Figure 4. The number of Be stars according to the age of cluster (Lyngå, 1985).

TABLE 1. Stars classified as Be in NGC 6530 and possible variable.

No.	V	B-V	U-B	Ref.	No.	V	B-V	U-B	Ref.
W35	10.38	0.14	-0.54	(1)	W58	9.76	0.22	-0.68	(1)
	10.47	0.15	-0.55	(2)		9.89	-0.01	-0.20	?(2)
	10.51	0.11	-0.59	(3)		9.86	0.18	-0.65	(3)
	10.43	0.10	-0.54	(4)		9.78	0.26	-0.63	(4)
	10.42	0.13	-0.63	(5)		9.91	0.23	-0.73	(5)
W65	7.46	0.21	-0.90	(1)	W66	10.17	0.11	-0.64	(1)
	7.47	0.17	-0.96	(2)		10.14	0.08	-0.55	(2)
	7.42	0.16	-0.78	(3)		10.14	0.11	-0.65	(3)
	7.48	0.19	-0.78	(4)		10.16	0.11	-0.61	(4)
						10.19	0.12	-0.70	(5)

Notes: (1, Walker (1957); (2, Kilambi (1972)); (3, Sagar and Joshi (1978)); (4, Chini and Necke (1980)); (5, Feinstein (1984))

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