

ON THE PERCENTAGE OF Be STARS IN GALACTIC OPEN CLUSTERS

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Introduction

Knowing that especially young clusters can contain a considerable high fraction of Be stars (Mermilliod 1982, Feast 1972) we made a spectroscopic study of H α on the ratio of B/Be stars. The aim was to select normal B stars for chemical abundance analyses.

It is well known that a promising way to investigate the evolutionary status of Be stars is to study their frequency and positions in the H-R diagram of open clusters. However, these studies have not yet provided satisfactory results (cf. e.g. Slettebak 1985); observations concerning the B/Be star ratio are badly needed. Therefore we present our observations although they are only a by-product from a different program.

Observations

The observations have been carried out at the Calar Alto Observatory, Spain, with the 1.23 m telescope and a photon counting Reticon. We observed in the red spectral range (Dispersion 80 Å/mm) to see whether H α is in emission or absorption. Altogether we observed 15 stars in 6 clusters (see Table 1). For 9 stars we obtained additional spectra in the blue spectral range (Dispersion: 60 Å/mm) to derive the spectral type.

From the investigated stars only one star in NGC 6611 shows H α in emission. However, since this emission is very narrow we conclude that it is due to the HII gas in which the cluster is embedded rather than to a Be star nature of this object.

Table 1

<u>Open Cluster</u>	<u>Number of stars observed</u>	<u>V</u>
NGC 457	2(1)	10.2, 10.6
NGC 6611	2	9.5, 12.0
Tr 35	2(1)	13.0, 13.5
NGC 6755	6(4)	10.2, 12.9
NGC 7235	2(2)	10.5, 11.0
NGC 7790	1(1)	11.0

Table 1 lists the open clusters with the numbers of stars observed. In brackets are given the numbers of stars for which we obtained additional spectra in the blue spectral range. In the third column are listed the magnitudes of the observed stars.

Discussion

Particularly we obtained spectra for six stars in NGC 6755. Four stars were observed both in the blue and in the red spectral range. With the age of 3×10^7 years (Lindoff 1968) NGC 6755 is one of the oldest clusters observed. Our sample is not complete enough to draw definitive conclusions. Nevertheless, the fact that none of the six stars of our sample is a Be star is consistent with known results concerning the B/Be star ratio in comparable clusters of nearly the same age (cf. e.g., NGC 581 and NGC 457 in Schild and Romanishin 1976). This confirms the results of Mermilliod (1982) who found the Be star rate decreases with increasing age of the clusters. For a better comparison a more complete spectroscopic study of NGC 6755 is needed.

References

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 Lindoff, U.: 1968, Meddelande Lund Observatory Ser. I, No. 227.
 Mermilliod, J.-C.: *Astron. Astrophys.* 109, 48.
 Schild, R., and Romanishin, W.: 1976, *Astrophys. J.* 204, 493.
 Slettebak, A.: 1985, *Astrophys. J. Suppl. Ser.* 59, 769.

DISCUSSION FOLLOWING REITERMANN

Kilambi:

You said that you have not identified any Be stars in the study of six cluster or groups in your program and you are indirectly saying that Be/B ratio is age dependent. But by comparing the Be/B ratio of NGC6530 and NGC2264, which are of about the same age, you find that Be/B ratio of NGC 6530 is much higher than that of NGC2264. Do you have any comment on this difference?

Reitermann:

I don't know the data concerning the two clusters you mentioned, so I can not give any comment.