THE VARIABLE STARS IN NGC 6723

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Abstract*. A study has been made of the variables in the Southern Hemisphere globular cluster NGC 6723, which is suspected of being relatively metal-rich on the basis of its colour-magnitude diagram and of its integrated spectral type of G3. Seven new RR Lyrae stars and two bright red, probably semiregular, variables have been found and the suspected variable of Fourcade and Laborde has been confirmed. The complement of RR Lyrae stars is now 27, consisting of 4 *c*-type and 23 *ab*-type variables, the mean periods being $P_c = 0^d.292$ and $P_{ab} = 0^d.537$. On the basis of the two-colour diagram of the horizontal branch stars the cluster is considered to be virtually unreddened. Applying Christy's models to the data from this study we find the following parameters for the variables: $M_V = 1^m.10$, mass $= 0.42\ M_\odot$, and $Y = 0.4$.

DISCUSSION

Cox: In your diagram of the horizontal branch, I notice that the colour range of the *c*-type variables is not much occupied either by variable or non-variable stars. Can you comment?

Also are there other globular clusters which show such a dearth of *c*-type variables whereas the *ab*-type stars are of uniform abundance relative to the non-variable stars on both sides of the gap?

Menzies: The colour-magnitude diagram I showed is for a complete sample of stars in an annulus of width 2'.4 centered on the cluster. I have good colours for only 12 of the 21 variables in this region, but assuming the remainder to behave like these 12, I think the absence is real.

I don't know of any other cluster like this, but only relatively few have had their RR Lyrae stars and their colour magnitude diagrams studied in sufficient detail.

Schwarzschild: Are any efforts being made to work with larger plate scales to improve the quality of the photometric measurements?

Dickens: We have a series of plates of clusters taken at the Cassegrain focus of the Isaac Newton telescope (plate scale 6″ per mm) to investigate this question. One difficulty arises in the measurement of the large, soft images with conventional iris photometry and microphotometry of the images, which is very laborious, but is probably necessary to make full use of the information contained in the stellar images.

Schwarzschild: May I bring up a question of observational technique, not specifically directed to Dr Menzies but to all who have shown us new photographic photometric results? Crowding of star-images has frequently been mentioned during these last two days as a basic difficulty for accurate photometry in globular clusters. My question is: Are we nowadays adjusting our plate scale – by simple enlarging optics – to maximize our photometric accuracy under the crowded conditions or are we still taking most of our photometric plates (i.e. not the plates for discovery of variables by blinking) with the scales as they happen to come with the available instruments, without enlarging optics? If a really good plate has stellar images with half-power diameters of, say, one second of arc, the photometric information least troubled by background effects or close neighbours may be contained in a circle of one half second diameter. On the other hand the commonly used high-sensitivity plates give reasonable signal to noise ratios only for areas, say, 0.05 mm in diameter (strong exposures – for which we astronomers seem to be addicted to – do not generally improve the signal to noise ratio, but do waste telescope time). Under these conditions an optimum plate scale would seem to be ten sec of arc per millimeter. Are such optimized plate scales nowadays used?

* Details of this work will be published elsewhere.

J. D. Fernie (ed.), Variable Stars in Globular Clusters and in Related Systems, 178–179.

Menzies: For my part, I have put up with the plate scale provided. Increasing the plate scale won't reduce crowding very much because of the effects of seeing.

Racine: This is a very important point. Although increasing the focal length does not reduce crowding (because of seeing limitations), it increases the capacity per image element of the receiver and hence allows the sampling of a smaller image element to achieve the same statistical accuracy. As to what astronomers are in fact doing... well... I must say that most still put up with the plate scale given to them. However there has been some trend toward the use of finer grain emulsion (IIIaJ) which also provides a capacity increase.

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