MgI TRIPLET LINES IN COMPOSITE SYSTEMS

B. BARBUY, R.E. DE SOUZA, S. DOS ANJOS
IAG-USP, CP 9639, 01065-970 São Paulo, Brazil

ABSTRACT. We use information contained in CMDs of metal-rich globular clusters, in order to compute a grid synthetic spectra for 10 evolutionary stages. These synthetic spectra are added up to reproduce the composite spectra of S0/E galaxies.

1. Introduction

Renzini (this symposium) pointed out that stellar evolutionary tracks for metallicities above solar are presently difficult to compute for a lack of information on the helium abundance, besides the problem of dealing with very high opacities, suggesting that observed colour magnitude diagrams (CMDs) of metal-rich globular clusters are a better tool.

In the present work, in order to build composite spectra for metal-rich populations contained in bulges of S0/E galaxies, we have used the information contained in CMDs of the metal-rich bulge clusters NGC 6553 (Ortolani et al 1990), NGC 6528 (Ortolani et al 1992a) and Terzan 1 (Ortolani et al 1992b). Some characteristics of these clusters are a fainter red giant branch (RGB) tip, very red horizontal branch (HB), and the fact that the brighter giants are fainter by > 1 magnitude than metal-poor ones.

Further information on the clusters were provided by a high resolution analysis of a star in NGC 6553, where [M/H] = -0.2 was found, and the relative location of CMDs of different metallicities as shown in Bica et al (1991); from this work we concluded that the shift in colour is due to increasing opacities, i.e., it is essentially due to metallicity (and not temperature).

We adopt then the number of stars in each evolutionary stage from counts in CMDs of NGC 6553 and their respective temperatures are derived as described in Barbuy et al (1992). A library of 10 spectra was created for different evolutionary stages. The MgI triplet region at $\lambda\lambda$ 490-540 nm was computed, where atomic plus MgH,C_2,CN and TiO molecular lines were included.

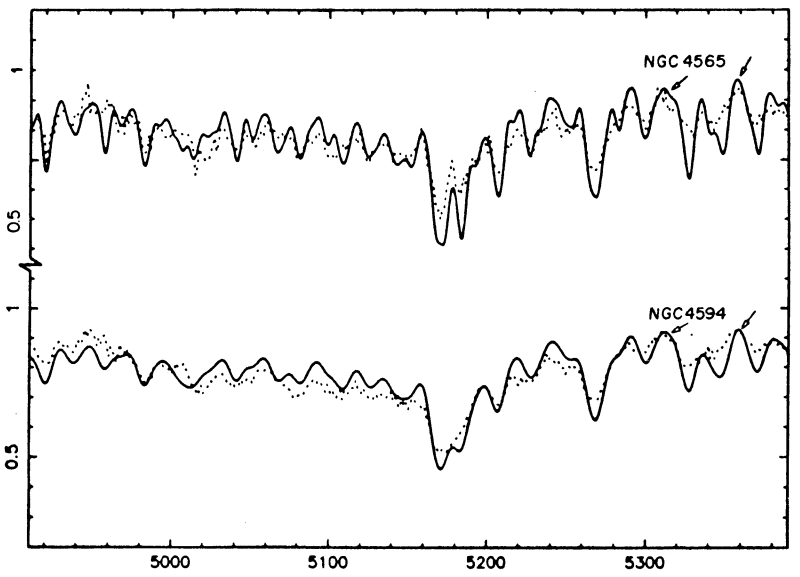
The synthetic spectra were then added up weighted by their luminosities and relative number of stars. These composite spectra are then fitted to observed spectra of lenticular galaxies. In Fig. 1 the matches, using synthetic spectra for [M/H] = 0.0, are shown for the galaxies NGC 4565 and NGC 4594. The observations are described in de Souza et al (this symposium). We see a main disagreement in the intensity of strong lines in the range $\lambda\lambda$ 523-538 nm, which will be further investigated.

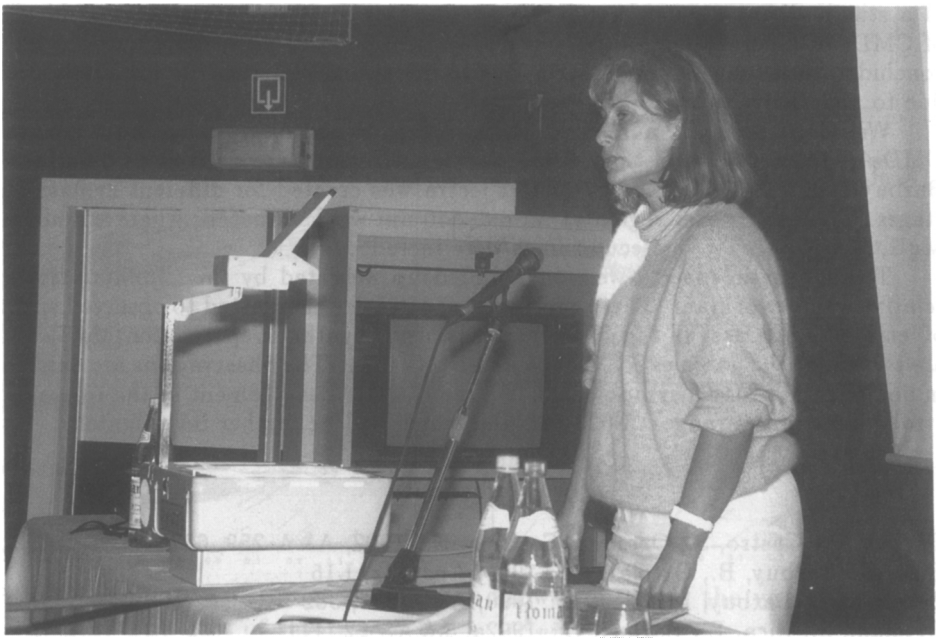
References

Barbuy, B., Castro, S., Ortolani, S., Bica, E.: 1992, A&A 259, 607
Bica, E., Barbuy, B., Ortolani, S.: 1991, ApJ 382, L15
Ortolani, S., Barbuy, B., Bica, E.: 1990, A&A 236, 362
Ortolani, S., Bica, E., Barbuy, B.: 1992a, A&AS 92, 441
Ortolani, S., Bica, E., Barbuy, B.: 1992b, A&A, in press

H. Dejonghe and H. J. Habing (eds.), Galactic Bulges, 287–288.

Figure 1 - Fit of synthetic spectra (solid lines) computed with [M/H] = 0.0 to observed spectra (dotted lines) of NGC 4565 and NGC 4594.





B. Barbuy

https://doi.org/10.1017/S0074180900123289 Published online by Cambridge University Press