

A HIGH SPATIAL RESOLUTION INVESTIGATION OF THE CORE OF SOME DYNAMICALLY EVOLVED GLOBULAR CLUSTERS.

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We present a high spatial resolution photographic study of the core of some concentrated globular clusters (F.W.H.M. of averaged star intensity profiles reaches $0''.5$ on the best plates). Good plates of M 79, M 53, M 3, M 5, M 13, M 92, NGC 6397, M 15, M 2 and M 30 were obtained (Aurière and Cordoni, 1983, *Astron. Astrophys. Suppl. Ser.* 52, 383 and references therein). The observations are mainly obtained at the 2 m and 1 m Cassegrain telescopes of Pic-du-Midi Observatory. The high spatial resolution of our plates enables us to achieve stellar photometry, at least for the bright stars, in these overcrowded regions. Surface photometry is also obtained.

We now present two new results concerning M 15 then M 30.

A possible optical counterpart for the M 15 globular cluster X-Ray source.

We have achieved a new high spatial resolution photographic study of 23 stars resolved in the error circle of the M 15 X-ray source. Our observations were obtained at the 3.6 m Canada-France-Hawaiï telescope (2U plates; F.W.H.M. of star profiles : $0''.85$) and at the 1 m and 2 m Pic-du-Midi telescopes (4B plates, 2V plates, 19 unfiltered image-tube plates, F.W.H.M. of star profiles : $0''.5 - 0''.85$).

We propose star AC 211 of the Aurière-Cordoni (1981) catalogue to be the optical counterpart of the X-ray source since :

- It is located $2''.7$ east from the X-ray source position (Hertz and Grindlay, 1983, *Astrophys. J.* 275, 105).
- It is a UV star ($B \sim 16$; $U - B < - 0.8$).
- It is a variable star (it almost disappears on one observation)
- Its optical properties are consistent with those of some low mass X-ray binaries (including Her X - 1) scaled to the X-ray flux of M 15 rather than with those of classical cluster variable stars.

The central brightness excess in M 30 (NGC 7099)

M 30 is found to show a central brightness excess over theoretical King's profiles (Djorgovski and King, 1984, *Astrophys. J.* 277, L 49).

Kron G.E. et al. 1984, Publ. Astr. Soc. Pac. 96, 198). We have made a B and V photographic study of the central part of M 30 with the 1 m Pic-du-Midi Observatory and 1.5 m Danish La Silla (ESO) telescopes. If a King's model distribution with $r_c = 15''$ is fitted to our data, a brightness excess occurs at radial distances smaller than $10''$. We resolve 46 stars in a circle centred on M 30 and of $10''$ radius. The light of these 46 stars corresponds to 75 % of the total brightness observed in the B and V passbands in the $10''$ radius circle. Their V magnitude distribution is quite consistent with that is expected from Sandage (1957, Astrophys. J. 125, 422) M 3 luminosity function. We have computed the brightness which arises from random fluctuations (\sqrt{N} stars, for N stars in the sample under study) in the number of the resolved stars of the region $0 < r < 10''$ and counted in the B and V magnitudes intervals : 13-14...16-17. We find that such a statistical fluctuation may explain only about 50 % of the observed brightness excess in the B and V passbands.

We conclude that if the core radius value of $r_c = 15''$ is significant for M 30, our observations and calculations show that the central brightness excess is unlikely to be due to a random fluctuation in the bright stars distribution.