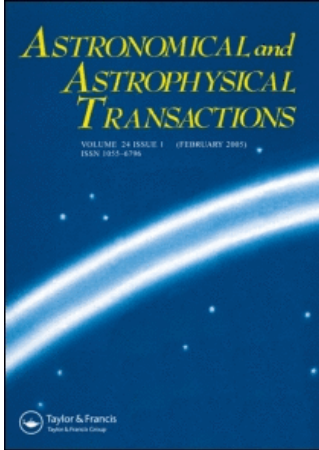


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Some properties of astroplates HT-1A

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SOME PROPERTIES OF ASTROPLATES HT-1A

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Experimental astroplates HT-1A were tested. It is shown that a good approximation to the Johnson–Morgan photometric band *B* can be obtained with a plate + glass filter combination. We have estimated the limiting magnitude for the stars on one specific plate.

KEY WORDS Astronomical plates

Unsensitized astroplates HT-1A with very fine granular quasi-T-crystal emulsion are produced by the Photoemulsion Laboratory of J.S.Co. SLAVICH in Pereslavl-Zalessky, Russia. An experimental batch of these plates was obtained by the Sternberg Astronomical Institute (SAI) for sensitometric and spectral analysis.

In this work we compare the spectral sensitivity of plate + filter BS-8 (Russian glass, 3-mm thickness) combinations to the Johnson–Morgan photometric band *B*. The experimental samples of these plates were hypersensitized by T. A. Birulya in the SAI photolaboratory by bathing the plates in a hydrogen atmosphere for 75 minutes at temperature of 56°C and pressure of 1 atm.

The plates were exposed for 10 min on the 250-mm, F/3.5 Maksutov camera of the Moscow Observatory of SAI in September 1992 by A. Burlak, G. Moshkin and D. Volod'ko. Three images of a photometric standard in the open cluster IC 4665 were obtained. The photometric magnitudes of 39 standard stars were taken from Johnson (1954). The standard stars were measured by the iris-photometer of SAI.

The average differences of instrumental magnitudes (for 3 plates) and the standard Johnson magnitudes are plotted in Figure 1 against the color indices *B* – *V*. A linear approximation using least squares method leads to the color equation:

$$\Delta m = (0.0067 \pm 0.0215)(B - V) + (0.017 \pm 0.014),$$

the standard deviation is $\sigma_{\Delta m} = 0^m.06$.

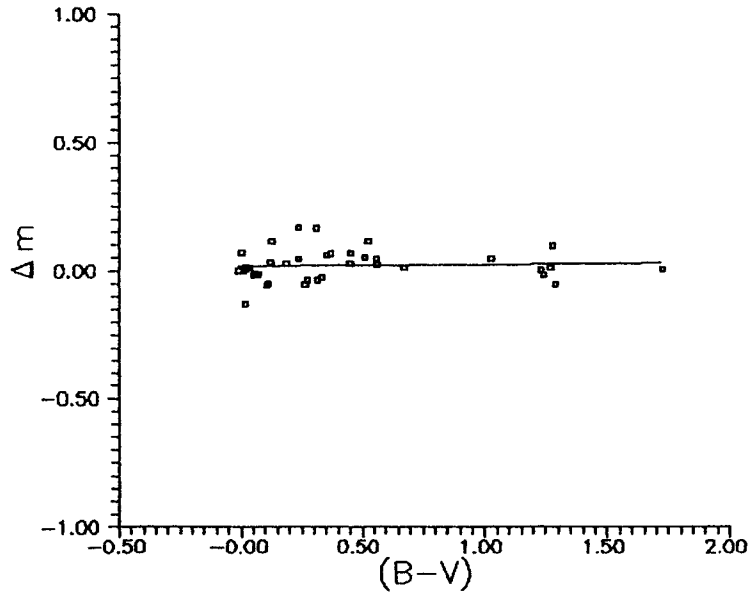


Figure 1 The averaged differences of instrumental magnitudes (for 3 plates) and the standard Johnson magnitudes against the colour indices $B - V$. The line represents the least squares fit.

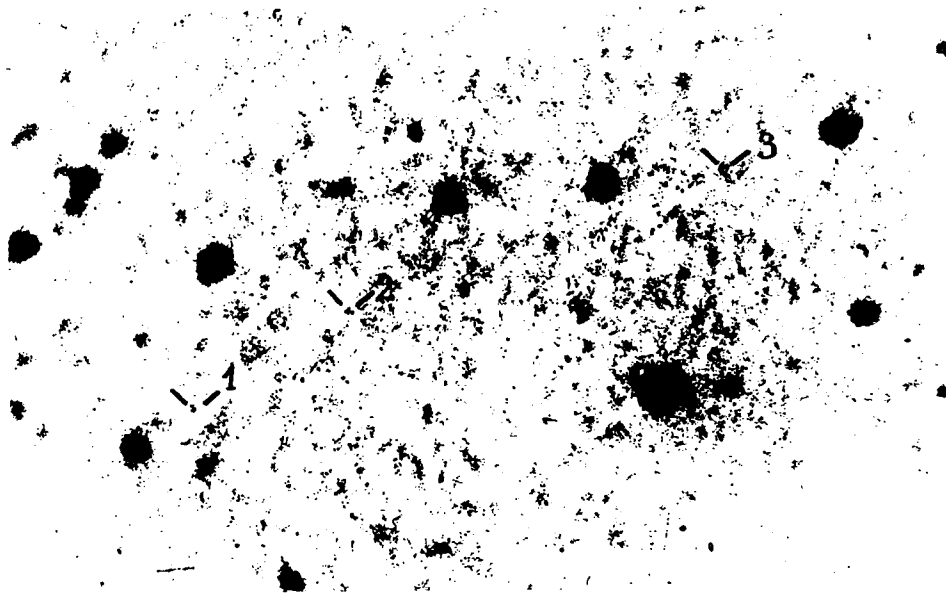


Figure 2 The region of the globular cluster NGC 6205. The faintest stars are marked (see text).

We conclude that there is no systematic colour-dependent difference between the instrumental and standard magnitudes and the instrumental system obtained is very close to the standard Johnson–Morgan B -band.

For illustration of the sensitivity properties, we have estimated the limiting magnitude of the image of the globular cluster NGC 6205 on our plate. This image was obtained on a plate of the same batch, using a 500-mm, F/4 Maksutov camera from the Crimean laboratory of SAI in July, 1992, by A. Martis and D. Zhukov. This plate was exposed for 60 min and then was developed for 7 min in a UP-2 developer.

To estimate the limiting magnitude on this plate, we used the photometric standard from Baum *et al.* (1959). We definitely identified three stars with the following B -magnitudes: 1 – 20^m51 , 2 – 20^m13 , 3 – 20^m53 (see Figure 2). Therefore the limiting magnitude is no less than 20^m4 .

We thank T. A. Birulya, A. Burlak, G. Moshkin, S. Shugarov, D. Volod'ko and D. Zhukov for their help and Prof. P. V. Sheglov for a useful discussion.

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