COLOUR EQUATIONS FOR TECHPAN FILMS

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1. Introduction

The UK 1.2m Schmidt Telescope (UKST) at Siding Spring Observatory in Australia has been routinely using panchromatic Tech-Pan emulsion on film as a detector since 1992. Details of how the telescope was adapted to take film and how hypersensitization techniques have been modified for film have been described by Parker (1992). The film has a much finer grain than its equivalent spectroscopic emulsion on glass (IIIa-F) and consequently records images typically one magnitude fainter than IIIa-F when properly hypersensitized. The improved depth, resolution and low noise also permit better differentiation between stars and galaxies (see Parker *et al.* 1994). Consequently Tech-Pan film has become one of the most useful and commonly used emulsions at the UKST for a variety of passbands and may in time be used for a full or partial sky survey.

Although its panchromatic spectral sensitivity broadly matches IIIa-F, it is important to determine what, if any, colour terms are present in the passbands commonly used with Tech-Pan film and see whether they differ from those found for IIIa-F by Blair & Gilmore (1982).

2. Observations

Four short exposure (2–5 min) Tech-Pan films were taken with the UKST for this purpose in the R waveband using the OG590 filter. The field was F284 (centre $20^h\ 04^m$, $-45°$) which includes the Harvard Standard Region E8.

The films were measured using the SuperCOSMOS machine in Image Analysis Mode at the ROE (Miller *et al.* 1992). Only the central 3° were measured in order to avoid vignetting problems,

B.J. McLean et al. (eds.), New Horizons from Multi-Wavelength Sky Surveys, 374–375.

3. Analysis

The SuperCOSMOS instrumental magnitudes were calibrated using low-order polynomials fitted to 42 standard stars measured in the Cousins system (Menzies *et al.* 1989) and not thought to be variable. A few stars deviated from the calibaration fit by more than 2.5σ as a result of image contamination from nearby stars or minor plate defects. These were excluded from the calibration. The differences between the standard photoelectric magnitudes and the magnitudes calculated from the calibrated SuperCOSMOS data were then plotted against photoelectric colour and linear fits were constructed. The differences between the four measurements of the colour term were commensurate with the error of each fit.

The mean colour term obtained is:

$$R-R' = (-0.033 \pm 0.010) \times (R-I) : \qquad -0.1 < (R-I) < +0.9$$

It is small and close to the value derived by Blair & Gilmore (1982) for IIIa-F on glass: $(+0.000 \pm 0.050) \times (R-I) : -0.0 < (R-I) < +0.9$. Therefore, replacing IIIa-F with Tech-Pan film will not introduce any significant photometric problems for R-band photometric programmes.

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