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A STANDARD COMPARISON SEQUENCE TO THE FLARE STAR YZ CANIS MINORIS

Standard two-colour photoelectric observations of comparison stars in the field of the flare star, YZ CMi, have been made by J.Eksteen at the Boyden Observatory. Several different magnitude sequences are currently being utilized to reduce flare observations of this star and this new photometry should improve the standardisation of material. With present increasing attention towards the secondary, possibly secular, variations of flare stars these results may be particularly valuable. The colour and magnitude sequence is also suitable for the description of flares observed visually and photographically with amplitudes of one and two magnitudes, respectively.

The 16-inch Nishimura reflector equipped with an E.M.I. 6256 photomultiplier and standard B and V filters was employed on two nights, 13 and 14 March 1969. Transformation to the Johnson standard photometric system was effected by the observation on each night of five bright stars (See Table 1) from the Arizona-Tonantzintla Catalogue (Ref.1), observed before and after the sequence.

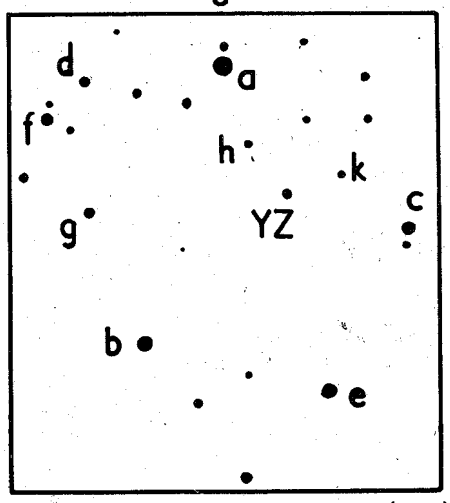

Table 1

BS	V	B-V
2646	$3^m.43$	$1^m.72$
2827	2.44	-0.09
2970	3.93	1.02
3045	3.35	1.25
3165	2.25	-0.27

Since the H.T.voltage was lowered for these bright stars, the zero point constants for each night in the V transformation were determined for the sequence by means of a fainter star in the field which had been observed earlier in the Johnson system (star c in Ref.2). The magnitude and colour transformation equations, in standard notation, were found to be:

$$V = v_o - 0.04(B-V) + \text{const.} \pm 0.034$$

$$B-V = 1.13(b-v)_o + \left\{\begin{matrix}0.683\\0.653\end{matrix}\right\} \pm 0.025$$

The large mean error in V for these bright stars reflects the scatter in the original measures (Ref.1) due no doubt to the rather large zenith distances employed at Catalina and Tonantzintla. This uncertainty is reduced, however, in our sequence by taking the local zero point star. Atmospheric extinction coefficients, typical of Boyden, k_V=0.23 and k_{b-v}=0.10, were applied at the small air masses encountered which were never greater than 1.3.

Photometric results from the two nights are given in Table 2, together with two additional fainter stars from Ref.2. In Fig.1 star a is HD 62525. A comparison of common stars in the photovisual and photographic sequences presently in use shows that of Mosidze and Chuadze (Ref.3) to be in fair agreement, but that of Bateson et al. (Ref.4) to be systematically 0^m.6 brighter. An unpublished photoelectric sequence by Solomon (private communication) shows agreement for our star b but large differences in colour and magnitude for star e which has consequently been removed from our sequence.

Table 2

Star	Nightly Values				Adopted Sequence	
	V		B-V		V	B-V
a	8^m.08	8^m.12	0^m.89	0^m.88	8^m.10	0^m.89
b	10.52	10.53	0.43	0.51	10.52	0.47
c	-	-	0.47	0.51	10.72	0.50
d	10.71	10.74	1.49	1.48	10.72	1.49
e	10.95	10.99	0.94	0.85	-	-
f	10.98	11.01	0.26	0.28	11.00	0.27
g	11.70	11.70	0.17	0.16	11.70	0.17
h	-	-	-	-	12.46	0.95
k	-	-	-	-	12.47	1.13

YZ CMi was observed on both nights and the results are given in Table 3. No sensible variation is evident as compared with my previous measures (Ref.2).

Table 3

J.D. -2440000	V	B-V
294^d.804	11^m.24	1^m.60
295.794	11.24	1.56

REFERENCES

1) H.L.Johnson et al., Com. of Lunar and Plan. Lab. No. 63 (1966).
2) A.D.Andrews, I.B.V.S., No.265, (1968).
3) L.N.Mosidze and A.D.Chuadze, Abastumani Obs.Bull.32, p.21, (1965).
4) F.M.Bateson et al., Charts for Southern Variable Stars Series 5 (issued from Mt.John University Obs.New Zealand).

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28 March, 1969

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