Photoelectric Observations of Selected Visual Binaries

Il-Seong Nha

Department of Astronomy and Meteorology
Yonsei University
(Received May 30, 1976)

Abstract

Standardized photoelectric magnitudes and color indices of 23 components of 17 visual binaries are presented.

Individual components of 17 visual binary and multiple systems have been observed with the 72-cm reflector of the Flower and Cook Observatory on five nights in 1969 and one night in 1970. The filters were those recommended by Johnson (1963) and the detector was an uncooled 1P21 multiplier photocell. No correctios for the red leak of the U filter have been made. For these observations the angular diameter of the focal plane diaphragm is $23''.4$.

The stars reported here are (a) brighter than $V = +9\overset{m}{.}0$; (b) separated by angular distances greater than the diaphragm diameter in order to minimize scattered light; and (c) at declinations north of $-10°$.

In Table I the first column gives the ADS number; the second, third, and fourth represent the observed values of V, $B-V$, and $U-B$, respectively, for the individual component stars; the fifth gives the number of individual observations for each star; and the sixth and the last columns represent the spectral type and the angular separation between components A and B, respectively.

Table. 1. *UBV* Observations of Visual Binaries

| ADS	V	B-V	U-B	n	Sp	ρ
5036 A	5.20	+1.58	+1.89	1	K4 III	31″
5188 A	6.66	+0.97	+0.81	1	K0	43.2
5233 A	8.61	+0.13	+0.14	2	A2	25.6
5379 A	6.81	+1.50	+1.87	1	M	23.8
5423 A	5.25	+0.55	+0.08	1	G0 V	31.2
5423 B	8.61	+1.58	+1.15	1		
5542 A	7.92	−0.05	−0.41	2	B	56.5
5542 B	8.16	+0.05	+0.01	2		
6724 A	5.91	+1.58	+1.91	1	gM0	44.4
6783 A	7.70	+0.62	+0.20	1	G0	29
6797 A	8.56	+0.99	+0.87	1	K0	29.0
6816 A	8.08	+0.09	−0.09	1	A0	24.6
6848 A	8.86	+0.43	+0.07	1	F5	35.8
6913 A	7.28	+0.59	+0.09	2	G5	26.5
6913 B	8.42	+0.83	+0.48	1		
6921 C	7.72	+0.18	+0.13	1	A9 V	63.2
7403 A	7.62	+1.61	+1.73	2	M	23.5
7438 A	6.77	+0.34	−0.01	1	F2	24.7
7438 B	8.05	+0.42	−0.01	1	F5	
9922 A	6.87	+1.02	+0.66	1		35.5
9922 B	8.11	+1.02	+0.86	1		
9933 A	5.03	+0.95	+0.64	1	G8 III	29.5
9933 B	6.29	+1.14	+1.11	1	gK2	
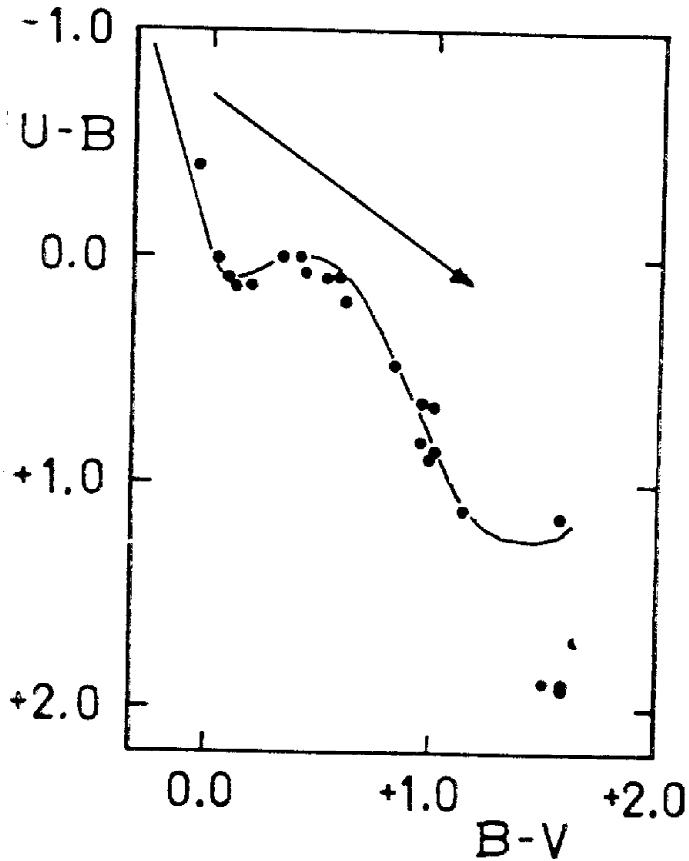
Fig. 1. Two-Color Diagram for 23 Stars.

For ADS 6921C the value represents the separation between C and A B combined.

Since the number of measurements per star was small, the probable errors of the transformed V, $B\text{-}V$, and $U\text{-}B$ values were calculated by combining the residuals from the means for five stars which were observed twice. They are ±0.011, ±0.016, and ±0.017 for the V magnitude range 7 to 9 respectively.

The two-color diagram for all stars is shown in Fig.1. The solid curve represents the relation between $(U\text{-}B)_0$ and $(B\text{-}V)_0$ for main sequence stars. Arrow represents the reddening trajectory. Among the very red stars ADS 5425B may be a main sequence star and ADS 5036A and 6724A are known giant stars. The remaining red objects, ADS 5379A and 7403A, may be giants because of their locations in two-color diagram.

Reference

Johnson, H. L. 1963. in Basic Astronomical Data, K. Aa. Strand, ed. (Chicago, University of Chicago Press), p. 207.