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A SEARCH FOR V567 SCORPII

Introduction

The Cepheid V567 Sco=HV 10793 was discovered by Henrietta Swope (1943). Unfortunately the published identification chart for this variable, which is located in a very crowded field, is of such small scale that positive identification proved to be impossible. In order to recover this object we therefore obtained photoelectric UBV photometry of a number of field stars located near the quoted position of the variable.

Observations

Observations of 13 non-variable stars situated near V567 Sco are listed in Table I. The stars in this table are identified in Fig. 1.

Table I
Observations of field stars

Star	V	B-V	U-B
1	10.42	0.14	-0.56
2	11.36	0.41	0.25
3	12.10	0.41	0.30
4	12.17	0.98	0.62
5	14.56	0.51	0.44
6	12.34	0.28	-0.05
7	13.38	0.48	0.37
8	12.72	1.29	1.06
9	14.84	0.75	0.21
10	12.17	0.99	0.61
11	13.90	0.52	0.41
12	13.58	0.57	0.33
13	13.01	1.59	1.80

The observations were carried out with the 1.5-m and 0.9-m telescopes of the Cerro Tololo observatory in 1978 (stars 1-9) and 1979 (stars 10-13). Star 10, which was originally thought to be the variable, was observed 4 times. All other stars were observed only once.

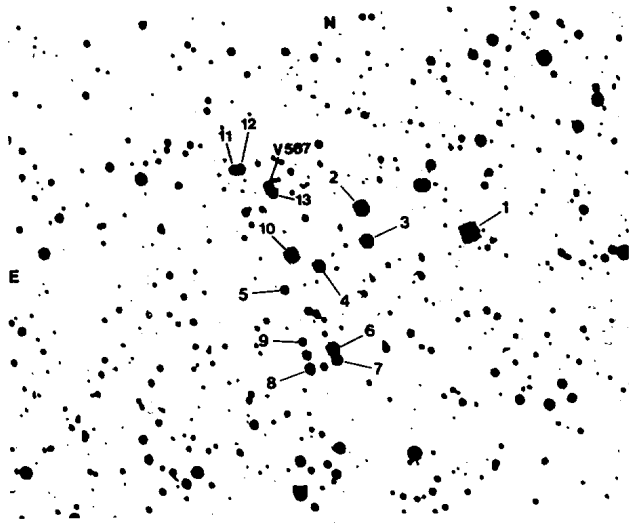


Fig.1. Identification chart for V567 Sco and comparison stars. The chart, prepared from a 103a0+GG385 plate obtained with the Curtis Schmidt has dimensions of 9.8x12.2 arc min.

Observations of the variable itself are given in Table II.

Table II
Observations of V567 Sco

Date	U.T.	V	B-V	U-B	Tel.
1979 Mar.21	08:40	12.21	2.17	2.21	1.5-m
Mar.23	07:55	12.42	2.18	2.32	1.5-m
Mar.31	08:17	13.31	2.13	-	0.9-m

Discussion

A color-magnitude and a color-color plot for the stars in Table I are shown in Figs. 2 and 3, respectively. Eight of the thirteen observed stars lie on, or close to, the loci that would be expected for a poor star cluster or association with $(m-M)_0 = 10.0 \pm 0.3$ (m.e.) and $E_{B-V} = 0.37$. Alternatively all of the field stars with $B-V < 0.6$ might be unrelated objects with $9.0 \leq (m-M)_0 \leq 11.0$ that are located behind a single absorbing cloud.

Unfortunately the three observations listed in Table II do not strongly constrain $\langle B \rangle$ and $\langle V \rangle$ for the Cepheid. Adopting

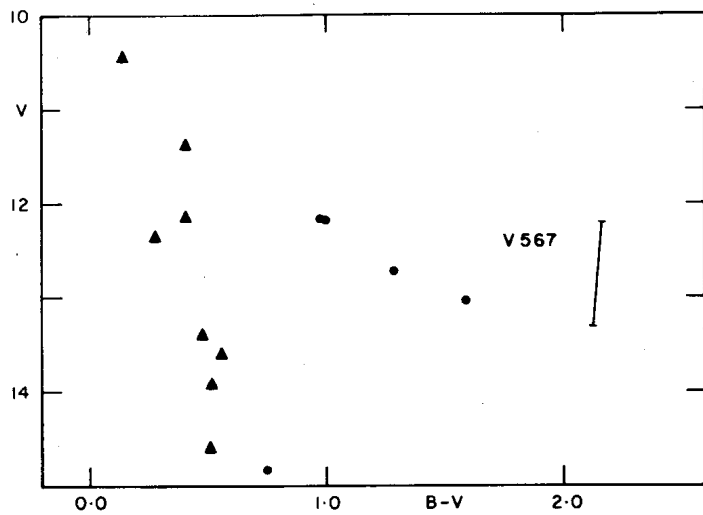


Fig.2. Color-magnitude diagram for field stars. Possible cluster members are shown as ▲.

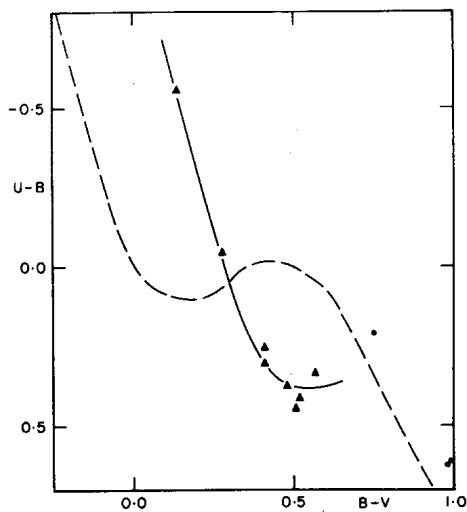


Fig.3. Color-color plot for field stars (●) and possible cluster members (▲). Also shown is the intrinsic color-color relation and the color-color relation for $E_{B-V}=0.37$.

$\langle V \rangle \sim 12.5$, $\langle B \rangle - \langle V \rangle \sim 2.15$, $M_{\langle V \rangle} = -5.62$ and $(\langle B \rangle - \langle V \rangle)_0 = 1.00$, which are the values derived from van den Bergh's (1977) calibrations of the period-luminosity and period-color relations for a Cepheid with $P = 34.04$ days, yields $A_V \sim 3.8$ and $(m-M)_0 \sim 14.3$. These values place V567 Sco well beyond the possible clustering of field stars discussed above.

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