UBV PHOTOMETRY OF NGC 581

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Abstract

NGC 581 was studied using new plates taken by the Kottamia 74" telescope and measured by the Helwan Iris photometer. A mean value of 3.13×10^7 years and 2334 pcs were found for the age and distance of the cluster respectively. The cluster has an evolved giant branch.

INTRODUCTION

NGC 581 is a young, bright and round open cluster of Trumpler type II3m in Cassiopia region. Previous photometric investigations (see references below) have contributed discrepant true distances ranging from 1200 to 3110 pcs. In an attempt to overcome such spread in distances and to investigate the variable reddening across this young cluster, UBV photometry has been carried out using plates collected during October 1979 with the 74" Kottamia reflector of plate scale 22".5/mm.

OBSERVATIONS AND MEASUREMENTS

Table 1 summarizes the observational material. The plates were measured in Helwan using the Askania Iris photometer of Becker's type and calibrated with the photoelectric sequence of Hoag et al (1961).

No of plates	Band	Emulsion+Filter	Exposure time (min)
4	U	103_aO+UG2	30
6	B	103_aO+GG13	10
4	V	103_aD+GG14	14

Table 1 : Observational material

A. Maeder and A. Renzini (eds.), Observational Tests of the Stellar Evolution Theory, 119–120.

The mean probable error in a single observation is found to be ±0.03 mag. in both B and V and ±0.05 mag. in U. All magnitudes fainter than U = 14.60, B = 14.36 and V = 13.76 are considered of less weight since they are obtained by extrapolating the standard sequence.

RESULTS

The two colour magnitude diagrams V-(B-V) and V-(U-B) are plotted in Figs 1 and 2. Large dots, circles and small dots represent, respectively, probable physical members, additional members supported by their

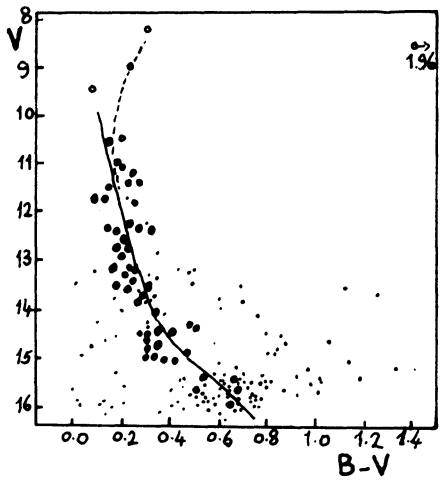

Fig. 1 : Colour-magnitude diagram V-(B-V)

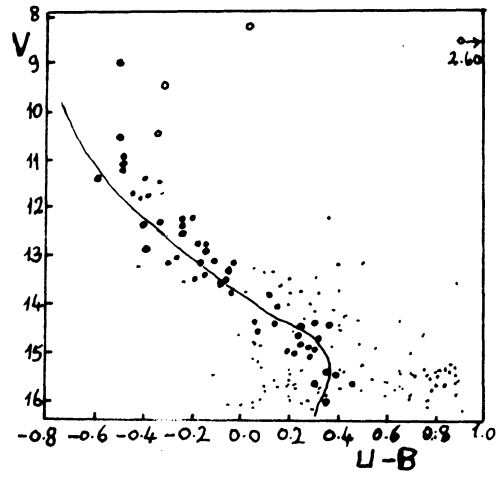

Fig. 2 : Colour-magnitude diagram V-(U-B)

proper motions (Oja, 1966) and field stars. Some stars at the upper end of the main sequence have evolved slightly. By the fitting method of the standard ZAMS of Schmidt-Kaler (1965) to the apparent C-M diagrams we obtained: m-M = 13.12±0.12 (m.e) (m-M)$_o$ = 11.84±0.12 E_{B-V} = 0.40 True distance = 2334±132 pcs Age = 3.13x10^7 years Apparent radius = 4!25 Linear diameter = 5.8 pcs.

Comparing the positions of the stars in both C-M diagrams 53 stars could be separated as probable physical members. The membership of only 45 of these stars has been confirmed by their proper motions, Oja (1966). For full details of this work see for the same authors J. Astron. Soc. of Egypt (1984).

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