

COLOR-MAGNITUDE DIAGRAM OF M35 WITH A DSLR

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ABSTRACT

We present a color-magnitude (CM) diagram of M35, an open cluster. A DSLR camera was used for measuring the color index with the RGB channels. It is cost-effective and has relatively easy controls compared to astronomical CCDs for educational environments. The 8-inch refracting telescope was used at the Korea Science Academy of KAIST in Busan. The B-G color index was obtained from observations and the magnitudes from publications in order to draw CM diagram. The linear correlation of B-G to B-V is found. The RGB channel of the DSLR camera can be easily represented on the CM diagram for astronomical education with aid of easy controls.

Key words: DSLR; color-magnitude; M35

1. INTRODUCTION

For educational purposes, using a DSLR camera instead of an astronomical CCD instrument makes the experiment easier because there is less effort for data reduction. In previous work (Kim et al., 2012), the color index B-G was estimated for M45 using the RGB components on a DSLR camera. The derived B-G index showed a linear correlation with the known B-V index. Here, we report a CM diagram of another stellar cluster, M35, and evaluate the correlation function.

2. DATA

Images of the the M35 open cluster were obtained using a Canon EOS 500D DSLR camera and an 8-inch refracting telescope at the school in Busan. The exposure time was 15 sec for each frame and the ISO number was 400. 20 images were manually selected to combine from 132 images with clear views. The brightness of each star was derived by summing the electron count in the area of a star in a square shape. The absolute magnitude data were obtained from SIMBAD and the observed B-G index derived from the ratio of electron counts.

$$m_B - m_G = 2.5 \log \frac{\text{count}_G}{\text{count}_B} \quad (1)$$

3. RESULTS

The CM diagram of M35 is shown in Fig. 1 for 38 stars. The CM diagram with the B-V index shows more scatter than that of the B-G index. The B-G index is compared with B-V index and it shows a linear relation (Fig. 2).

<http://pkas.kas.org>

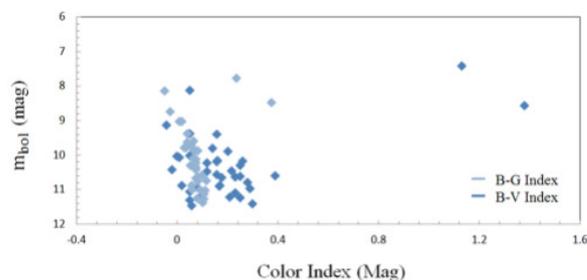


Figure 1. CM Diagram of M35. B-V index from SIMBAD

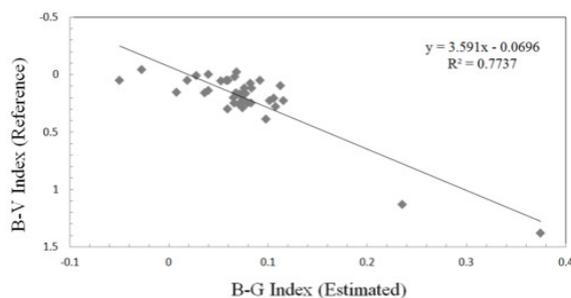


Figure 2. Comparison of estimated B-G index and known B-V index (SIMBAD) of 38 stars in M35

The linearity is quite different from the previous work ($y = 0.3x + 0.02$ in Kim et al. (2012)). More careful analysis and examination is required.

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