

**CORRELATION BETWEEN RED AND BLUE MAGNITUDE OF STARS IN
OPEN CLUSTER M34**

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ABSTRACT

CORRELATION BETWEEN RED AND BLUE MAGNITUDE OF STARS IN OPEN CLUSTER M34

An open cluster is a group of up to a few thousand stars that were formed the same giant molecular cloud, and is still gravitationally bound to each other. They are believed to originate from large cosmic gas and dust clouds in the plane of Milky Way. To determine the instrumental magnitude of the stars in this research, the aperture photometry method were used. The aperture photometry is a method of CCD photometry for determining the star's brightness with the use of three digital annulus to measure the brightness of the star. The scale used to represent the star's brightness is magnitude. In this research, 14 inch Celestron Telescope and CCD Camera Model ST-8XME were used. This research is done with the objective of to measure the correlation between blue and red magnitude of stars in open cluster M34, to know how to align a telescope and grab image using Charge Coupled device (CCD) camera and to know how to use Astronomical Image Processing (AIP) software to calculate the instrumental magnitude of stars. M34 is the open cluster used in this research. The instrumental magnitude of stars using blue filter are smaller than the instrumental magnitude of stars using red filter. From the value of the magnitude of the stars, the image of the stars using blue filter is brighter compare to the image using red filter. This show that blue filter has higher intensity and smaller wavelength than red filter for M34. For signal to noise ratio, blue filter has a higher value compare to red filter. From this value, it confirms that blue intensity is higher than red.

CHAPTER 1

INTRODUCTION

1.1 Background

Astronomy is one of the scientific study of the sun, the stars and their space, planetary system, sky with it cloud and others. Astronomy can be done through observation and theory. Astronomy studies are so wide. There are many types of research that astronomers do such as astrometry, photometry, spectroscopy and astrophotography.

Astrometry is a branch of astronomy that deals with the positions of stars and other celestial bodies, their distances and movements. It is one of the oldest subfields of the science, the successor to the more qualitative study of positional astronomy. Astrometry dates back at least to Hipparchus, who compiled the first catalogue of stars visible to him and in doing so invented the brightness scale basically still in use today. Modern astrometry was founded by Friedrich Bessel with his *Fundamenta astronomiae*, which gave the mean position of 3222 stars observed between 1750 and 1762 by James Bradley.

Astrometry is also fundamental for fields like celestial mechanics, stellar dynamics and galactic astronomy. In observational astronomy, astrometry techniques help identify stellar objects by their unique motions. It is instrumental for keeping time. Astrometry is also involved in creating the cosmic distance ladder because it is used to establish parallax distance estimates for stars in the Milky Way.