

## PEP 151 Lab 2 Report

### Distance Determination from Cepheid Variable Stars

Name: Julia Nelson

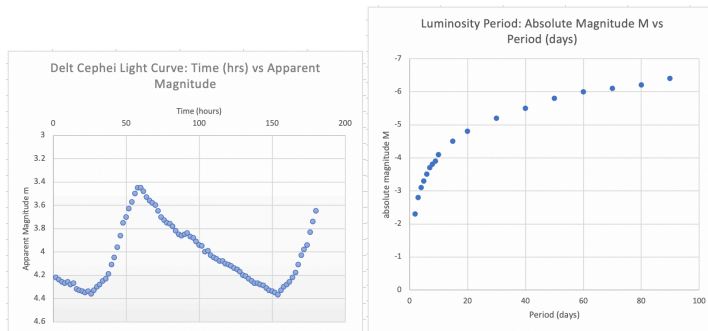
I pledge my honor that I have abided by the Stevens Honor System.

#### I. Introduction

In this lab, we are using information on light cruves from Cepheid Variable star called “delta Cephei” to determine its distance. Both time/period and absolute and apparent magnitudes are taken into consideration.

#### II. Plots

(Insert the light curve and luminosity-period relation plots you made using either excel or other package. The plots need to have titles with units on the axes to clearly indicate what you’re plotting.)



#### III. Results

From the light curve above, I have determined that the pulsation period of “delta Cephei” to be \_\_\_\_\_125\_\_\_\_\_ hours, or \_\_\_\_\_5.2\_\_\_\_\_ days.

From the light curve, I have also determined the average apparent magnitude of “delta Cephei” to be  
 $m = \underline{\hspace{1cm}} 3.91 \underline{\hspace{1cm}}$ .

$$(4.37+3.45)/2 = 3.91$$

From the luminosity-period relation plot and use the pulsation period I have determined above, I estimate the absolute magnitude of “delta Cephei” to be  $M = \underline{\hspace{1cm}} -3.3 \underline{\hspace{1cm}}$ .

Using the relation between apparent magnitude  $m$  and absolute magnitude  $M$ :  $m-M=2.5 \log_{10}(d/10)^2$ , I have calculated the distance  $d$  to be \_\_\_\_\_276.694\_\_\_\_\_ parsecs.

$$m-M=2.5 \log_{10}(d/10)^2$$

$$3.91-(-3.3) = 2.5 \log_{10}(d/10)^2$$

$$7.21 = 2.5 \log_{10}(d/10)^2$$

$$d = 276.694$$

Looking up resources online (cite your source), the established value for the distance to “delta Cephei” is \_\_\_\_\_n/a\_\_\_\_\_ parsec.