

Interstellar Extinction - Exercise Sheet

Observational Astronomy

1 Extinction Measurement

1.1

Count the number of stars in the field and those obscured by the cloud for three different wavebands by the method of star counting.

λ nm	Field Count	Obscured Count

1.2

Now obtain ratios of average counts of field stars to the average counts of obscured stars within each wavelength region.

λ nm	Average (N/N_0)	$\log(N/N_0)$
420		
640		
800		

1.3

Calculate the extinction for the Coalsack in each wavelength region assuming that the density of stars changes with magnitude as:

$$\frac{\Delta \log(N)}{\Delta m} = -0.4$$

2 Grain Density

Using one of the values of extinction from the first exercise, obtain an estimate for the number of grains per unit cross-sectional area (m^2) in the cloud. For this we will use a grain radius of 3×10^{-7} m.