

Astrophysics 3; Semester 1; Worked Example

1. 2007-8 Degree Exam, Question B1.2 (b and c)

A spectrum of *Star A* indicates that it is an A0 star, like Vega. What does this imply about the intrinsic optical colours of the star? Why might the observed optical colours differ from this? [4]

Star A is observed to have an apparent V magnitude of 18.35 and an observed $B - V$ colour of 0.33. Assuming that at optical wavelengths the extinction law can be approximated as $A_\lambda \propto \lambda^{-1}$, determine what the apparent V magnitude of the star would have been in the absence of extinction. The B and V filters can be assumed to be centred at 440nm and 550nm respectively. [6]