Ay 192 — Problem Set 4

Due Dec 13, 1999

Problem 1. On the attached page are two *different* I band filter transmission curves both for filters used at CTIO. What are the effective wavelengths and bandpasses of these filters to (a) a flat spectrum (in f_λ) source, (b) a 100,000°K blackbody (a hot white dwarf), and (c) a 2500°K blackbody (an M star)? (Hint: write a short computer program to do numerical integrations over the filter curves. You're going to have to trace the curves.)

Gift: Don't worry about the atmospheric absorption!

Problem 2. Using the calibration data for Vega and the UBVI filter transmission curves (data tables available from my webpage for UBV and Vega, use your above curves for I), what would you predict the (U-B), B-V) and (V-I) colors to be of our flat spectrum source, white dwarf and M star? Remember that in alphabet photometry, the colors of Vega are defined to be = 0.00.

How different would you expect the transformation equations for V-I for each of the filters in problem 1 to be?