Homework 8

(1/29, 30 minutes)A color of a star gives the ratio of fluxes in two different wavelength bandpasses. When expressed in magnitude units, colors are given by a difference in magnitude between two different wavelength bandpasses and areoften defined relative to the colors of some other objects. For example, in the VEGAMAG (e.g., UBVRI) system, all colors are relative to the color of the star Vega, i.e. in this system, the color of Vega is defined to be zero. The spectrum (Fλ) of Vega is (very!) roughly proportional to λ^{-2} (in the optical), i.e. Fλ(Vega) $\approx$ 3.6 x 10-9$\left(\frac{\lambda}{5500}\right)^{-2}$ergs/cm2/s/.

1 **If you approximate the B bandpass as a square bandpass between 4000 and 5000 , and the V bandpass as a square bandpass between 5000 and 6000 , what is the flux of Vega in both B and V**

2 **If you observe a star that has B - V = 1 and V = 20, what is its flux in the B and V bandpasses?**

3 **What does it mean, quantitatively, for an object to have B-V = 1.0 ?**

4 **If a star with a spectral energy distribution like Vega has a magnitude of 21 at 4500 in the VEGAMAG system (i.e. spectrum same shape as Vega, but normalized differently), what would its magnitude (m(4500)) be in the STMAG system? the ABNU system? What would the m(4500) - m(5500) color be in each of the three systems?**