Homework : measuring stellar brightnesses and stellar colors with virtual simulat...

Science, Physics

Part Minimum exposure time required to see the star utilizing the eye with virtual detector Case 80 seconds Case 2= 20 seconds

Case 3= 20 seconds

Case 4= 20 seconds

Minimum exposure time for the difference amidst the numbers in the green box and red box approximated within the range 50 – 100

= 80-20

= 60 seconds

Part 2

1. Wavelength of the peak emission when temperature is at 8000

$\lambda1$= 2. 9* 106/ 8000

= 362. 5nm

2. Wavelength of the peak emission when the temperature 4000

$\lambda2$= 2. 9* 106/ 4000

= 725nm

3. Ratio of the two wavelengths

Ratio= $\lambda2$/ $\lambda1$

= 725/ 362. 5

= 2

The ratio is genuine since a temperature of 4000k possesses twice-longer wavelength than 8000k

4. Color of the star at 7000k

A white star possess a temperature of approximately 7000k

5. Color of star at temperature of 4500k

An orange star a surface temperature of 4500

6. Temperature that produces a B-V value of 0. 5

B-V = -3. 684 log (T) + 14. 551

B-V = 0. 344 [log (T)]2 -3. 402 log (T) +8. 037

For the log (T) > 3. 961

Temperature= 6517. 196 °K

7. Percentage in Temperature

B-V value of 0. 5= 6517. 196°K

B-V value of 0. 6= 0. 6/0. 5*6517. 196 °K

= 7820. 6352 °K

Percentage change in temperature= (7820. 6352-6517. 196)/ 6517. 196 8 100%

= 20%

Thus, 20% change in temperature produces 10% change in B-V

8.

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9.

As the star becomes cooler and red, the B-V color index escalates since lesser magnitudes designates brighter light. Hot stars possess a small B-V whilst cool starts possess a bigger B-V. This makes B-V to lose temperature sensitivity for the underlying hot stars. Moreover, hot starts radiate blue and corresponding ultra-violet wavelengths.

10.

Exterior temperature of the underlying star is determined precisely by assessing the prevailing colors of the light it emits. Observation of the spectrum discloses the existing temperature of the prevailing stars' surface

(Seeds & Dana, 135-189). Careful observation at the stars within the sky depicts that the sky is compose of diverse colour mostly white, blue and red. A spectrum starts from ultra violet via the visible wavelengths and via infrared

(Chromey, 232-278). Nevertheless, the general shape of the spectrum is the identical to the hot objects, hotter objects that radiate relatively more energy mainly directed to the blue and underlying ultra violet end of the existing spectrum.

Works Cited

Seeds, Michael A, & Dana E. Backman. Astronomy: The Solar System and Beyond. Belmont, CA: Brooks/Cole, Cengage Learning, 2010. Print.

Chromey, Frederick R. To Measure the Sky: An Introduction to Observational Astronomy. Cambridge: Cambridge University Press, 2010. Print.