Astronomy 101 for 2 year college - lab report example

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1. A. The sun is 287, 000 km bigger than the Earth B. Sun would hold approximately 3 million Earths (since the volume goes as the cube of the radius).

C. 3. 33 x 10/5 power

2. A. (a) relative to the supergranular pattern, facular points appear at the supergranular boundaries, rarely inside the cells; (b) relative to the pattern of the granulation, they appear in spaces at the junction of several granules, never inside a granule nor in a space between two granules only; (c) their mean lifetime is 18 min; (d) they remain in intergranular lanes during their whole life; (e) their observed size never significantly exceeds 0. 5; (f) they have a strong tendency to appear very close to an already existing facular point; (g) about 15% of them seem to split in two facular points; (h) they disappear simply by fading away in an intergranular space; (i) they never merge with another facular point or with a granule.

B. The brighter dots are hotter areas.

C. Small dark regions called sunspots. Sunspots are cooler regions on the photosphere. Since they are 1000--1500 K cooler than the rest of the photosphere, they do not emit as much light and appear darker.

3. A. Photosphere.

B. During a total solar eclipse, an exceptional situation occurs, and for a few fleeting seconds, an emission spectrum can be observed. This happens at the very beginning of totality and just after the last bit of photosphere has been covered by the Moon. (Picture 1) For a period of several to perhaps ten seconds the chromosphere is visible as a red arc. (Recall that the

chromosphere is a very thin layer just above the photosphere.) Often prominences are seen jutting from the chromosphere. The deep red color of the chromosphere comes from very strong emission in the hydrogen-alpha line at 656 nm. Because the chromosphere is quite rare and hot (with a temperature of about 10, 000 K) it shows an emission spectrum in the absence of any light from the much brighter photosphere. Of course, the advance of the Moon soon covers the chromosphere and then the much rarer corona becomes visible as a broad white halo. Within minutes totality reaches completion, the chromosphere reappears on the opposite side of the Sun followed seconds later by the overwhelming brightness of the photosphere. (Picture 2)

Because the chromosphere is so thin, it forms an ideal subject for spectral imaging. A diffraction grating inserted in the light path of a telescope separates the light according to wavelength (just as in your spectrometer). An attached camera will then record the chromosphere imaged in each of the component wavelengths in its emission spectrum. This is the flash spectrum, so-called because of its brief accessibility.

C. 1. 300 Kilometers wide.

2. 300 Kilometers wide.

6. A. Diamond Ring Effect

B. Because the chromosphere is quite rare and hot (with a temperature of about 10, 000 K) it shows an emission spectrum in the absence of any light from the much brighter photosphere. Of course, the advance of the Moon soon covers the chromosphere and then the much rarer corona becomes visible as a broad white halo.

C. Solar filter. Look at the sun only through a proper solar filter. This is a

special filter made of either glass or mylar coated with a virtually opaque layer of aluminum. A solar filter cuts down sunlight by 99. 9999%. It transmits only about 1/1000th of one percent of the light. (Note: The solar filter fits over the large end of the telescope. Never use a small solar filter that screws into the eyepiece — the heat of the sun will crack it.)

D. 300 kilometers

E. The corona.

7. A. 0 Latitude

B. No.

C. The sunspots suggest the same rotation of the photoshere.

8. A. The sunspots give a reference point in the time it takes the sun to rotate.

B. A day.

C. Equator.

D. No always.

9. A. The preumbera is the outside. The umbera is the inside shape.

B. 169 millionth.

C. 42. 15 millionth.

D. Sunspots are cooler than the sun’s photosphere.

10. A. 1. Location. 2. Human error.

B. G= 40 F= 5 R= 45

11. A. Yes

B. 36 years

C. 4 years

D. 180

E. 2001

F. 1996

G.

H. High activity.

12. A. 40 degrees North and 40 degrees South

B. 40 degrees North and 40 degrees South

C. 50 degrees North and South

D. 30 degrees North and South

E. Lower

F. Yes

G. 40 degrees North and 40 degrees South