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SID Monitor Data Analysis Sheet

Analyze the data from 9/17/2006-9/24/2006
File can be found N:\Courses\Rod Physics\SOLARSID\Data
Email pages 1,2 & 5 only!! Add the last name of one of your group members to the beginning of the file "rodriguezDataSIDSunriseActivity.doc"

1. With your teacher, look through the instructions on the Example Sheet and make sure you understand them.

2. My monitor is located in Cincinnati, Ohio, Eastern Time.
   The transmitter is located in Cutler, Maine, Eastern Time.

3. By reading the graphs or data files, figure out the sunrise and sunset times of your data and write that information into your data table.

4. Figure out your local sunrise and sunset times for the days for which you have data: http://aa.usno.navy.mil/data/docs/RS_OneDay.html. Then, convert your local time to UT time (you can find out how at http://www.timezoneconverter.com/cgi-bin/tzc.tzc), and write that information into your data table.

5. Figure out the sunrise and sunset times for the location of the transmitter, convert to UT, and write that information into your data table as well.

6. Plot your data for both sunrises and sunsets on the graphs provided.

7. By reading your data table and your graphs, answer the following questions:
   a) Are your data **sunrise** times
      No - Same as your local sunrise times?
      No - Same as the transmitter sunrise times?
      Yes!!! - Neither?

   b) Are your data **sunset** times
      No - Same as your local sunset times?
      No - Same as the transmitter sunset times?
      Yes!!! - Neither?

   c) Compute the average difference in time between local sunrises/sets and your data sunrises/sets.
      - The average difference between local **sunrise** and data sunrise is 1 hour, 1.4 minutes
      - The average difference between local **sunset** and data sunset is 0 hours, 17.3 minutes

d) Does the relationship between sunrise and set times remain roughly the same each day, or does it change? If it changes, what do you think might be the causes(s)?
The relationship between sunrise and sunset does not stay the same; by a couple of minutes each day, the two events are occurring within a closer proximity to each other. The sunrise is occurring later in the day, and the sunset is occurring earlier in the day. This is caused by the nature of earth's revolution and the tilt of its axis. As the winter solstice approaches, the length of time between these two events will continue to decrease in the northern hemisphere in this fashion because it is tilting away from the sun.

e) Is the signal strength
Yes!!! - Higher at night?
No - Higher during the day?
No - Same at night as in the daytime?

f) Are your data noisier (with more squiggles) during the nighttime or the daytime?
Yes!!! - Noisier at night
No - Noisier during the day
No - Same at night as in the daytime

Why do you think?
Our data is noisier at night because changes are occurring in the ionosphere. These changes cause more fluctuations in the radio wave signal. As the D and E layers of the ionosphere disappear, the radio waves become stronger because less of them are being absorbed.

g) Is there a time in your data where it looks like you have no signal at all?
Yes, on September 18 between the following UT times: 12:12 and 19:49.
This is probably because the transmitter was turned off for maintenance during this time.

h) If your monitor picked up a solar flare, it would appear as a sudden spike (or occasionally a sudden drop) in signal strength. And only during the daytime. Why?
A monitor will only pick up a solar flare during the daytime because that is when the monitor is facing the sun.

Do you think you found a flare?
No, no flares. Sorry. There weren't any significant spikes on any of our graphs. The only spikes that were there were most likely caused by local events.

i) Read the sheet on how the ionosphere changes during the daytime, nighttime, during a solar flare, and during a lightning storm. Can you identify any lightning storms in your data?
Yes, there were lightning storms on Sept. 23 from approx. 1:00 UT to 7:00 UT.

SID Monitor Sunrise/Sunset Worksheet

Analyze the data from 9/17/2006-9/24/2006
File can be found N:\Courses\Rod Physics\SOLARSID\Data

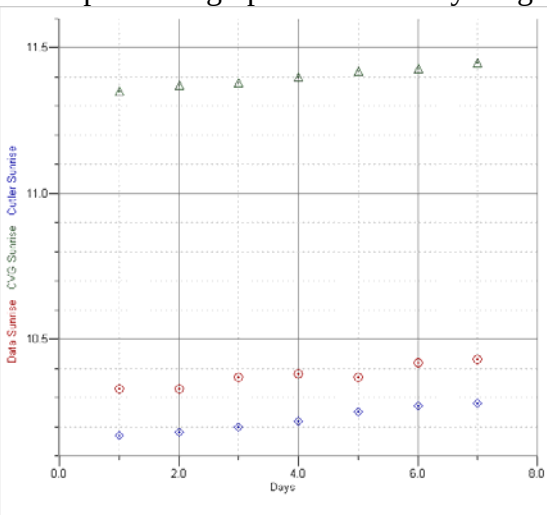
My monitor is located in: Cincinnati, Ohio Timezone: Eastern Standard Time
The transmitter is located in: Cutler, Maine Timezone: Eastern Standard Time

	Data Sunrise (UT)	*Local Sunrise (UT)*	*Transmitter Sunrise (UT)*
Day 1	**10:20**	**11:21**	**10:10**
Day 2	**10:20**	**11:22**	**10:11**
Day 3	**10:22**	**11:23**	**10:12**
Day 4	**10:23**	**11:24**	**10:13**
Day 5	**10:22**	**11:25**	**10:15**
Day 6	**10:25**	**11:26**	**10:16**
Day 7	**10:26**	**11:27**	**10:17**

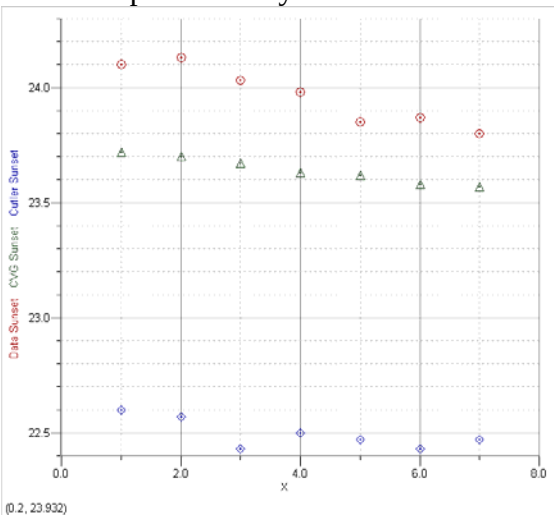
To find sunrise and sunset times, see http://aa.usno.navy.mil/data/docs/RS_OneDay.html
To convert from local to UT time, see http://www.timezoneconverter.com/cgi-bin/tzc.tzc

	Data Sunset (UT)	*Local Sunset (UT)*	*Transmitter Sunset (UT)*
Day 1	**0:06**	**23:43**	**22:36**
Day 2	**-0:08**	**23:42**	**22:34**
Day 3	**0:02**	**23:40**	**22:32**
Day 4	**-0:01**	**23:38**	**22:30**
Day 5	**-0:09**	**23:37**	**22:28**
Day 6	**-0:08**	**23:35**	**22:26**
Day 7	**-0:12**	**23:34**	**22:25**

Replace the graphs below with your graphs from Graphical Analysis



Sunrise Graph



Sunset Graph