

Lab #1 Using Filters – The Difference is like Night and Day

The purpose of this lab is to introduce students to the MOSAIC Graphical User Interface (GUI) provide by MIT Haystack. Students will begin to appreciate the underlying nature of the data collected by the various MOSAIC units installed.

Consult the MOSAIC User's Guide and lesson plans for more detail.

Material Needed

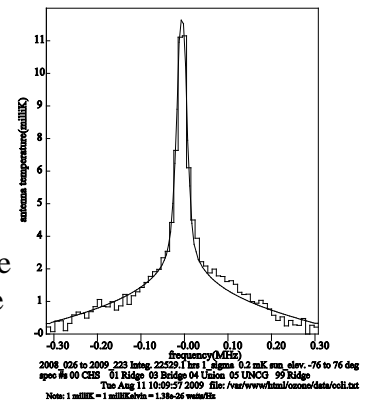
- Computer connected to the internet.
- Printer (optional)

Set-up

Go to the MOSAIC GUI at <http://www.haystack.mit.edu/ozone/>

Trials

Click the RESET button at the bottom of the page. Then click SUBMIT. The default parameters you have selected will include data from all MOSAIC units for all times of the night and day for as long as they have been making observations. You should see a plot similar to the picture at right. Notice the peak in this plot is approximately 11 mK. (Radio scientists report the antenna power as a temperature. This is the power an equivalent blackbody would radiate, even though the source of this radiation is a rotation of the Ozone molecule)



You may save this file by right-clicking on the link in the upper-right-hand corner of the plot screen. The files will be saved as an encapsulated postscript image.

The power of the GUI lies in the user's ability to filter the data. Starting at the default condition, go to Step 2 and select "Show only data when the sun is" and then enter in the second box below **-10** deg elevation. This will yield data which was taken at night. Now click SUBMIT.

Ask the students why you have chosen -10 instead of sunrise/sunset at 0 deg? The answer: the Ozone you are observing is in the Mesosphere, between 70 – 100 km above the surface. Sunrise is a little earlier and sunset is a little later at those altitudes.

When you plot the data, you should see a similar graph, but the vertical scale has changed slightly. Notice that the peak is now around 22 mK, double the previous measurement. This would be an excellent time to discuss the processes which form and destroy Ozone in the Mesosphere.

