

## Installing Panoply: A NASA tool for viewing netCDF, HDF, and GRIB data

Go to <https://www.giss.nasa.gov/tools/panoply/>

Download the linux \*.zip file

Unzip the file and cd into the Panoply directory

Run the panoply.sh script

## AOSC 652: Analysis Methods in AOSC

Data visualization:

**EXELIS**

First,

Copy    ~tcanty/IDL/symbols.pro  
          ~tcanty/IDL/oploterror.pro  
          ~tcanty/IDL/colorbar1.pro

into your [idl](#) directory.

These programs allow you to plot different types of symbols, error bars, and a color bar.

# AOSC 652: Analysis Methods in AOSC

Data visualization:

EXELIS

## Can we do more than just line plots?

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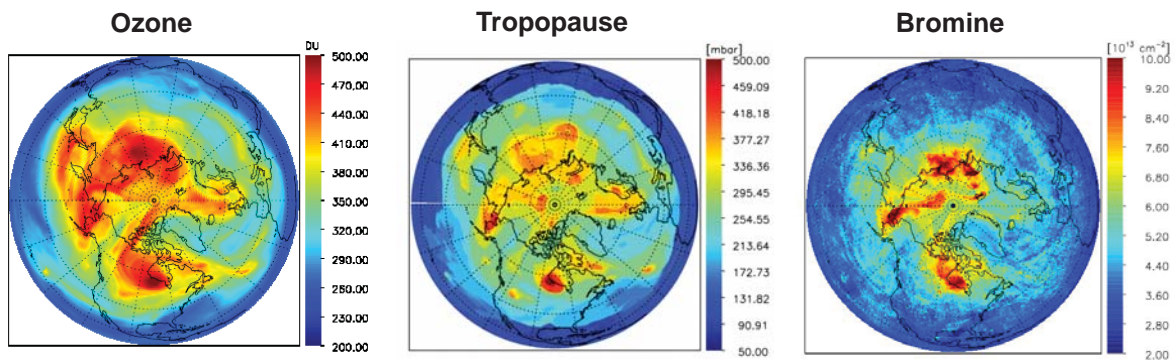
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EXELIS

080405



These figures show plots of total column ozone (left), tropopause pressure (center), and total column bromine. The ozone and bromine observations are taken by the OMI instrument onboard the Aura satellite. From [Salawitch et al., 2010](#)

<http://aura.gsfc.nasa.gov/instruments/omi.html>

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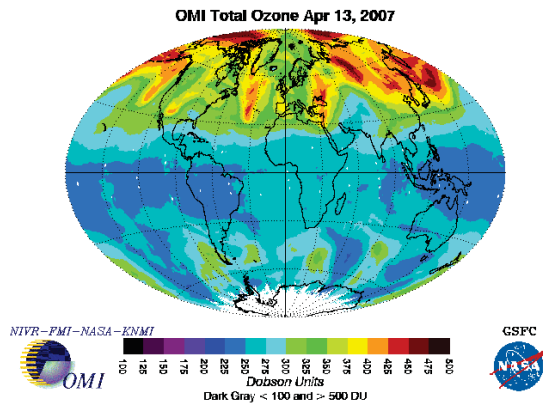
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EXELIS



Recognize this?

Please copy:

```
~tcanty/AOSC652/2016/week_11/plot_omi*.pro  
~tcanty/AOSC652/2016/week_11/*.dat  
~tcanty/AOSC652/2016/week_11/*.he5
```

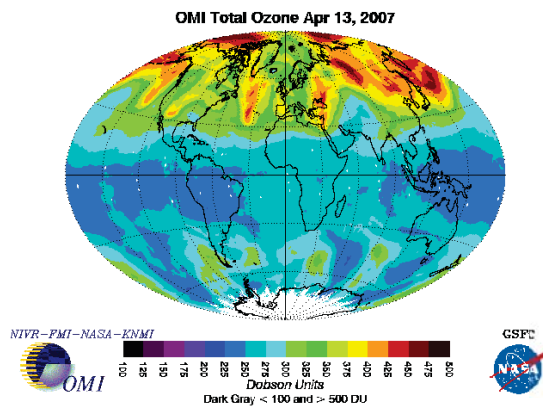
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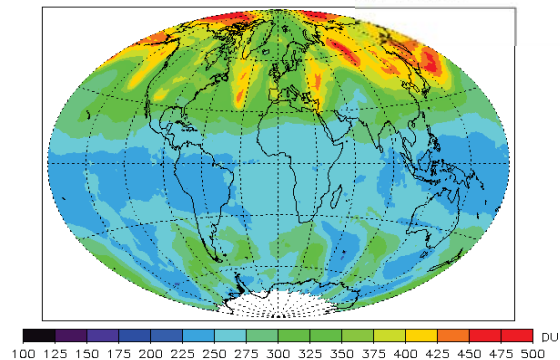
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L3\_ozone\_omi\_20070413.txt



Please run `plot_omi_vers01.pro`

This link explains various types of map projections (note IDL can not do all of these styles)

<http://www.quadibloc.com/maps/mapint.htm>

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# AOSC 652: Analysis Methods in AOSC

## A quick review of contour plotting



If you wish to make a contour plot over a map of the globe in IDL,

1<sup>st</sup> Set up your map projection:

```
map_set, /AITOFF,0,0,/continents,latdel=30,londel=30
```

**map\_set** describes how the map projection is displayed

**/AITOFF** is the map projection

**0,0** is the Longitude and Latitude that the map will be centered on.

**/continents** adds continents to the map

**latdel/londel** determines the spacing between lines of latitude and longitude

# AOSC 652: Analysis Methods in AOSC

## A quick review of contour plotting



If you wish to make a contour plot over a map of the globe in IDL,

1<sup>st</sup> Set up your map projection:

```
map_set, /AITOFF,0,0,/continents,latdel=30,londel=30
```

2<sup>nd</sup> Set and plot data contours:

```
o3_levels=100+25*indgen(17) ;the contour levels we wish to plot  
o3_colors=7+indgen(16)*16 ;the color index for each contour
```

```
contour,o3_column,lon,lat,levels=o3_levels,c_colors=o3_colors,/cell_fill,/overplot
```

**contour** – plots contours on the map projection

We specify the contour levels, **levels=o3\_levels**

We specify the colors for each contour, **c\_colors=o3\_colors**

**/cell\_fill** fills the contours

**/overplot** preserves the existing map without erasing it.

# AOSC 652: Analysis Methods in AOSC

## A quick review of contour plotting



If you wish to make a contour plot over a map of the globe in IDL,

1<sup>st</sup> Set up your map projection:

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```

2<sup>nd</sup> Set and plot data contours:

```
o3_levels=100+25*indgen(17) ;the contour levels we wish to plot  
o3_colors=7+indgen(16)*16 ;the color index for each contour
```

```
contour,o3_column,lon,lat,levels=o3_levels,c_colors=o3_colors,/cell_fill,/overplot
```

3<sup>rd</sup> Most of our continents are now covered with colored contour lines, so we will replot our map.

```
map_set, /AITOFF,0,0,/continents,latdel=30,londel=30,/noerase,title=filename
```

Note: you must add `/noerase` to the second call to `map_set` or everything we've plotted previously will be erased.

# AOSC 652: Analysis Methods in AOSC

## A quick review of contour plotting



If you wish to make a contour plot over a map of the globe in IDL,

1<sup>st</sup> Set up your map projection:

```
map_set, /AITOFF,0,0,/continents,latdel=30,londel=30
```

2<sup>nd</sup> Set and plot data contours:

```
o3_levels=100+25*indgen(17) ;the contour levels we wish to plot  
o3_colors=7+indgen(16)*16 ;the color index for each contour
```

```
contour,o3_column,lon,lat,levels=o3_levels,c_colors=o3_colors,/cell_fill,/overplot
```

3<sup>rd</sup> Most of our continents are now covered with colored contour lines, so we will replot our map.

```
map_set, /AITOFF,0,0,/continents,latdel=30,londel=30,/noerase,title=filename
```

4<sup>th</sup> Add a colorbar:

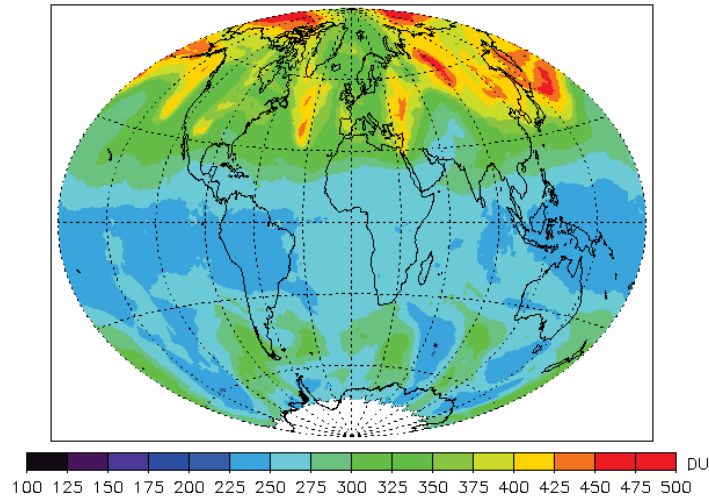
```
colorbar1,o3_levels,o3_colors,format='(I3)',unit='DU'
```

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**EXELIS**

If we've done everything correctly, our figure should look something like:

L3\_ozone\_omi\_20070413.txt



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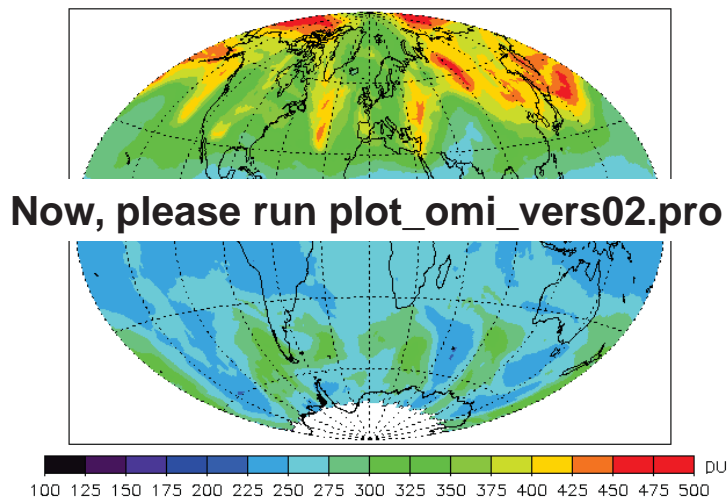
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# AOSC 652: Analysis Methods in AOSC

**EXELIS**

If we've done everything correctly, our figure should look something like:

L3\_ozone\_omi\_20070413.txt



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## AOSC 652: Analysis Methods in AOSC

To use a much wider range of colors, please look at and run  
`plot_omi_vers03.pro`

**EXELIS**

First, set up you map projection as before:

```
map_set, /AITOFF,0,0,/continents,latdel=30,londel=30
```

Second, assign a specific color to each data point:

```
col_range=[7,245]  
o3_range=[100,500]  
symbols,2,1  
  for i=0,nlat-1 do begin  
    for j=0,nlon-1 do begin  
      if (o3_colimn(j,i) ge 50 and o3_column(j,i) le 700) then begin  
        color=interpol(col_range,o3_range,o3_columnj,i)  
        if color gt 245 then color=250  
        plots,lon(j),lat(i),psym=8,color=color  
      endif  
    endfor  
  endfor
```

## AOSC 652: Analysis Methods in AOSC

**EXELIS**

If you wish to make a contour plot that uses a much wider range of colors,

To plot symbols, we'll use the program `symbols.pro` that you copied into your idl directory.

`symbols, symbol #, scale size`

Example:

`symbols,2,1`

`plots,x,y,color=40,psym=8`

**plots a filled circle, of size =1**

**psym=8 tells IDL to use a "user" defined symbol**

SYMBOL NUMBER:

1 = open circle

3 = arrow pointing right

5 = arrow pointing up

7 = arrow pointing up and left (45 degrees)

9 = arrow pointing down and right.

11 through 18 are bold versions of 3 through 10

20 = box

22 = triangle

31 = filled diamond

2 = filled circle

4 = arrow pointing left

6 = arrow pointing down

8 = arrow pointing down and left

10 = arrow pointing up and right.

19 = horizontal line

21 = diamond

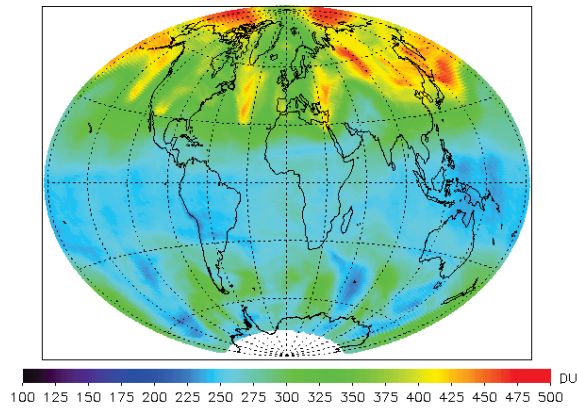
30 = filled box

32 = filled triangle

# AOSC 652: Analysis Methods in AOSC

EXELIS

L3\_ozone\_omi\_20070413.txt



**Follow steps 3 and 4 from earlier and our plot should look something like this.**