**Downloading and Formatting Pierre Auger Observatory Data**

NOTE: This set of instructions was created using a PC running Microsoft Excel 2007. Some of these instructions will likely be different for Mac users

1) Go to: http://www.auger.org/



2) In the right hand menu, click on **Event Display**
3) In this page there are several ways to view event data. The way you choose to display this data depends largely on what you wish to accomplish with it. This guide is focused on the use of data for **ALL EVENTS**

   a. To download data on all events you must click on the <u>ascii file</u> link on the second paragraph. This will download a .txt file containing data for every public event since January 1st 2004. The file should look something like this:



```
# Auger Public data file, built on Wed, 07 Jul 2010 15:20:53
#
##########################################################
#
# Fields:
#
# 1: Event Id
# 2: Number of Stations in Event
# 3: Theta of incoming reconstructed cosmic ray
# 4: Phi of incoming cosmic ray
# 5: Reconstructed Energy (EeV)
# 6: Unix time in seconds (seconds since 1st Jan 1970, w/o leap seconds)
# 7: Galactic Longitude (deg)
# 8: Galactic Latitude (deg)
#
####
#
620100 3 15.9606 66.5061 1.5952 1072936424 -117.861 9.74423
620400 3 26.5494 -101.793 0.355838 1072964627 -41.5096 -2.20725
620800 3 22.8514 -30.7643 0.613309 1073009810 -108.484 -24.868
621400 3 43.2584 44.7172 0.750369 1073079948 155.425 -60.5886
622200 3 24.0716 26.1112 0.283068 1073168340 -158.134 -72.3622
622800 3 22.2321 -154.025 0.333249 1073236969 -10.8102 -7.6192
625800 3 34.3345 -128.556 0.352402 1073583032 -25.9538 -11.4969
626100 3 42.2738 61.8234 0.314927 1073619805  145.183 10.5576
```

   The data may be analyzed using any software of your choosing. Microsoft Excel is a reasonably good choice. The following steps describe how to copy all the data to an Excel File.

   b. Open Microsoft Excel click on the office icon , click  and choose the .txt file from the location in which you saved it.
   c. Choose Delimited, since the data fields are separated by spaces in the text file.



Choose the file type that best describes your data:
   ⊙ Delimited    - Characters such as commas or tabs separate each field.
   ○ Fixed width   - Fields are aligned in columns with spaces between each field.
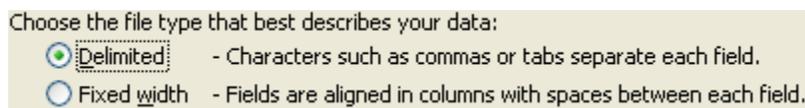
   d. Click **Next >**
   e. In the next screen deselect "Tab" and select "Space". This will tell Excel to interpret information separated by spaces as separate columns.
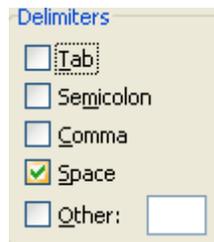
In this same window Excel will show a small preview of what the data will look like. Scroll down in this preview window to make sure your data are organized correctly. If your data look as shown in this picture it should be ok



f. Click [Next >] and select "General" in the following screen then click [Finish]
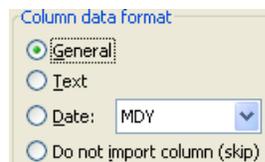


g. Your data should be neatly organized in a spreadsheet. You'll notice that the data columns are not directly labeled. What you have is a legend at the top identifying each "field". Each "field" is essentially a column. If you wish to simplify reading the data you may label the columns directly.



**What the data labels mean**
1) **Event ID** – Every time an event is recorded it is assigned it's own identification number to help distinguish it from the rest
2) **Number of stations in event** – when a cosmic ray produces a shower it "hits" a number of stations in the Auger array of stations.
3) **Theta of incoming cosmic ray–** zenith angle
4) **Phi of incoming cosmic ray–** azimuth angle
5) **Reconstructed Energy –** energy of the original particle that caused the shower in EeV.
6) **Unix time** – time elapsed in seconds from January 1st 1970 at 12:00 am to the moment the event was recorded.
7) **Galactic Longitude and Latitude** – direction of the original cosmic ray with respect to the Milky Way Plane