

updated Summer 2018

Using e-Lab to make flux plots

Start at <http://www.i2u2.org/elab/cosmic>  
Log in using Username UHmasterT for teachers  
UHmasterS for students

From the Student Home page,  
point to the Data box, then move to the Flux box and click it

On the Choose data for flux study page,  
select Detector ID and enter the 4-digit DAQ number  
select All in the Blessed box inside the Advanced Search box  
and then enter the range of dates 01/01/2018 to 03/31/2018  
then click the Search Data box  
(For detailed instructions click the Step-by-step instructions  
link under Help on this page.)

After a few seconds, you'll see a page similar to Fig. 1.  
click the small triangle to the left of the site you select  
then click the small triangle to the left of the month and year  
then click the boxes for the days you want to use  
then click the Run flux study box.  
(The example in Fig. 1 used date range 08/01/2012 to 08/03/2012  
for DAQ 6773.)

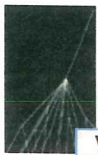
After a few seconds, you'll see a page similar to Fig. 2. The  
list of data files you selected contains the numbers of counts  
in each of the 4 channels of the detector. Below that is a box  
which contains options for a flux plot. If you selected more  
than one day of data, it is preferable to change the Bin Width  
from 600 to 3600 seconds. Then  
click the Analyze box  
(To change the minimum on the Y-axis, change the Y-min value  
under Plot Controls. Leave Y-min blank for automatic selection.)

After several seconds, you'll see a plot similar to Fig. 3. (If  
not, click the Refresh status box.) To save the plot, enter  
a name in the empty box near the bottom of the page and then  
click the Save Plot box. To view saved plots, click the  
View Plots box near the top of the page. To check the rates for  
individual channels, click the View blessing plots link above  
the plot. To redo the plot with different parameters, click the  
Change your parameters link.

Compare your flux plot with the following saved plot for the same DAQ.  
Use the same Y-min and Bin Width values.

DAQ	site	plot name	Y-min	Bin Width
6993	BYU-Hawaii	byuhjanmar2018	300	86400
6948	Kamehameha	kamhsjanmar2018	400	86400
6432	Punahou	punahoujanmar2018	200	86400
6100	Windward	wccjanapr2018	300	86400
6423	Shizuoka	shizuoka6423janmar2018	2500	86400
6663	Fermilab	fna16663janapr2018	10	14400

Below are plots showing unexplained short-term variations.  
6100 Windward wccmar2018, variations after 3/16  
6432 Punahou punahoufeb7to8, large increases for <30 min  
punahoufeb7bin1min, 3 times on 2/7  
punahoufeb8bin1min, 2 times on 2/8



# Cosmic Ray e-Lab

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## Choose data for flux study.

Things in nature change over time. Populations grow, stars explode, galaxies spin, and the universe expands. Measuring some attribute over time, observing it change and then looking for what caused the change is central to all of the physical sciences. The rate at which cosmic rays arrive is called "flux." You can look to see if the flux at a certain place changes over time or compare rates at different places. Can you find out why?

Gain confidence by running a practice search.

Quick Searches: [UHManoa](#), [Mike Jones](#), [University of Hawaii-Manoa](#), [Manoa, HI](#)

Detector ID

[Search Data](#)

▼ Advanced Search

Please enter dates in MM/dd/yyyy format (e.g. 06/06/2018).  
You may leave one or both date fields blank.

Start Date  to

Search:  All data  Refine results with extra parameters

Stacked:  Blessed:

[View and Search from detector map](#)

\* To speed up searches by default we are retrieving the last 3 months worth of data for the criteria you chose.  
You can modify your date range using the Advanced Search criteria.

---

Results 1 - 1 of 1 for detectorid 6773 (Searched 6 files in 0.143 seconds)

[Clear selected data](#)

▼ **BYU - Hawaii**  
Laie, HI  
6 data files: 6 blessed, 6 stacked, 307,730 total events.

▼ August 2012, 6 files Select: [All](#) [None](#)

Detector 6773, 6 files Select: [All](#) [None](#)

<input checked="" type="checkbox"/> <b>Wed 01</b>	<input checked="" type="checkbox"/> <b>Wed 01</b>	<input checked="" type="checkbox"/> <b>Thu 02</b>	<input checked="" type="checkbox"/> <b>Thu 02</b>
2,467 events	233,334 events	13,941 events	22,449 events
<input checked="" type="checkbox"/> <b>Fri 03</b>	<input checked="" type="checkbox"/> <b>Fri 03</b>		
1,954 events	33,585 events		

**Analyze**

[Run flux study](#)

**Help**

[Tutorial on flux study](#)

[Step-by-step instructions](#)

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States include provinces and countries.  
Enter the [abbreviation](#)

**Related Milestones**

[Analyze Data](#)

[Correct Data](#)

[Assemble Evidence](#)

**Legend**

- View data
- Rollover for more info
- Unstacked data
- Stacked data
- Blessed data
- Click to view blessing charts
- Rollover for more info
- Unblessed data
- Click to view blessing charts
- Rollover for more info
- Data has comments - Add more/View
- Add comments

You cannot select files with No Geo for Flux, Shower or Lifetime Studies.

FIG. 1



# Cosmic Ray e-Lab

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Calculate the flux for your data file. Remember, flux = particles / time / area

This analysis looks at the arrival rate of cosmic ray muons over time. The calculations average the instantaneous arrivals and create a scatter plot of rate vs. time.

Gain confidence by running a practice analysis.

[Understand the graph](#)

DAQ#	You're analyzing...	Chan1 events	Chan2 events	Chan3 events	Chan4 events	Raw Data	Remove from analysis
6773	BYU - Hawaii Aug 1, 2012 01:00:00 UTC	111046	106858	109645	107998	<a href="#">View</a> <a href="#">Statistics</a> <a href="#">Geometry</a>	<input type="checkbox"/>
6773	BYU - Hawaii Aug 1, 2012 02:54:53 UTC	1467561	1400188	0	0	<a href="#">View</a> <a href="#">Statistics</a> <a href="#">Geometry</a>	<input type="checkbox"/>
6773	BYU - Hawaii Aug 2, 2012 01:00:00 UTC	89393	85135	0	0	<a href="#">View</a> <a href="#">Statistics</a> <a href="#">Geometry</a>	<input type="checkbox"/>
6773	BYU - Hawaii Aug 2, 2012 02:31:42 UTC	1474919	0	0	808340	<a href="#">View</a> <a href="#">Statistics</a> <a href="#">Geometry</a>	<input type="checkbox"/>
6773	BYU - Hawaii Aug 3, 2012 01:00:00 UTC	72082	0	0	64513	<a href="#">View</a> <a href="#">Statistics</a> <a href="#">Geometry</a>	<input type="checkbox"/>
6773	BYU - Hawaii Aug 3, 2012 02:13:57 UTC	1508125	1443319	1472157	1400451	<a href="#">View</a> <a href="#">Statistics</a> <a href="#">Geometry</a>	<input type="checkbox"/>
Total (6 files 11721730 events)		4723126	3035500	1581802	2381302	<a href="#">Compare files</a>	<input type="checkbox"/>

[Remove](#)

Analyze the same files in [lifetime](#) or [shower](#)

Click **Analyze** to use the default parameters. Control the analysis by expanding the options below.

▼ **Analysis Controls**

Channel Number

Bin Width (seconds)

▼ **Plot Controls**

X-min

X-max

Y-min

Y-max

Plot Size:

Plot Title:

Figure caption:

FIG. 2



# Cosmic Ray e-Lab

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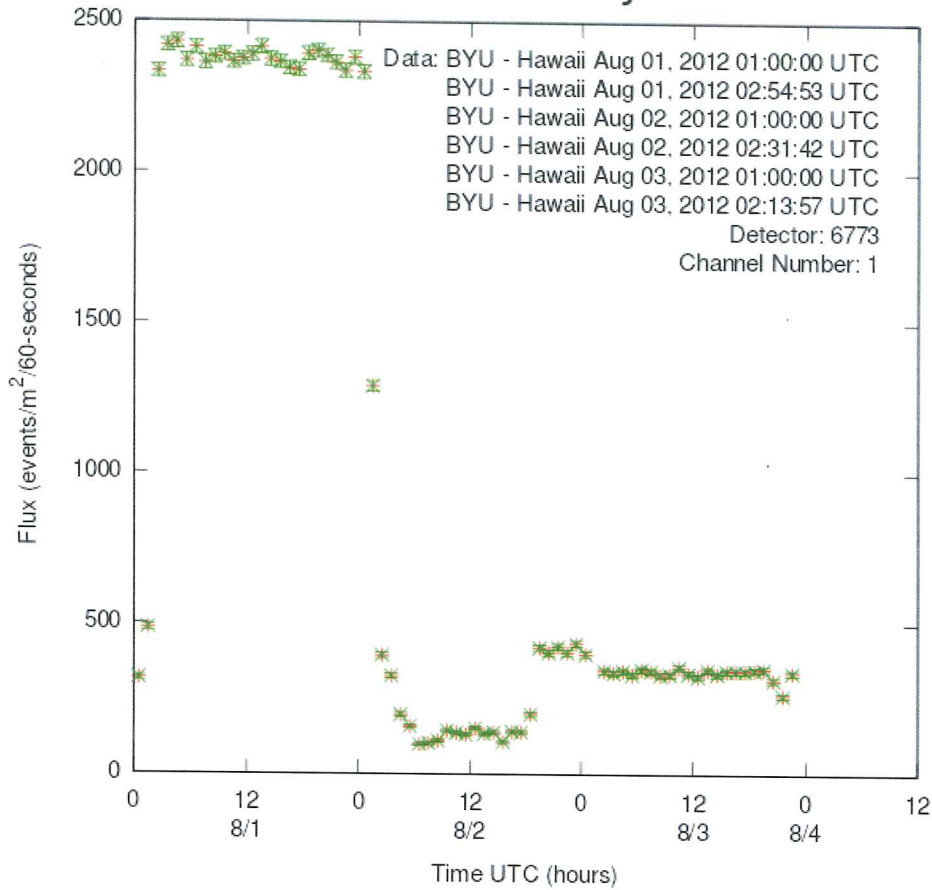
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[View blessing plots](#)

## Flux Study



Analysis run time: 00:00:13

Show [analysis directory](#)

[Change](#) your parameters

OR

To save this plot permanently, enter the new name you want.

Then click **Save Plot**.

(View your saved plot names)

[Save Plot](#)

FIG. 3