

Application of KCDC platform for non-collaboration analysis: reconstruction of moon and sun shadows seen by KASCADE

Vladimir Samoliga ¹, Dmitriy Kostunin ²

¹ API ISU, ² DESY



Motivation

- KCDC provides an opportunity for data analysis by third parties
- Interest for looking for point sources, transients, etc
- Testing of KCDC platform itself

KASCADE Cosmic Ray Data Centre (KCDC)

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Data Preselections for download

ASCII 'Data Preselections' for direct download

ReducedData-KASCADE_runs_0877-4683_ASCII	all KASCADE quantities in the run range 877-4683, no cuts applied, no data arrays, data format ascii	size: 7.1 Gb	details
Full data sample from the releases VULCAN and MERIDIAN			
ReducedData-KASCADE_runs_4685-7417_ASCII	all KASCADE quantities in the run range 4685-7417, no cuts applied, no data arrays, data format ascii	size: 12.9 Gb	details
ReducedData-GRANDE_runs_4775-7398_ASCII	all GRANDE quantities in the run range 4775-7398, no cuts applied, no data arrays, data format ascii	size: 5.0 Gb	details
ReducedData-CALOR_runs_877-5496_ASCII	all CALORIMETER and KASCADE quantities in the run range 877-5496, no cuts applied, no data arrays, data format ascii	size: 9.8 Gb	details
HighEnergyData_runs_0877-7417_ASCII	Events with a reconstructed primary energy above $10^{15.7}$ eV, no data arrays, data format ascii	size: 179 MB	details
SmallDataSample_noDataArrays_runs_0877-7417_ASCII	Data sample with every 400 th event of the whole data set included are all detector components, no data arrays, data format ascii	size: 64 MB	details

Data Preselections

If you are interested in 'Preselections' this menu offers the option to download the data sample directly without selecting quantities and applying cuts in the DataShop. 'details' provides a more detailed information page of the respective data set. The 'Small Data Samples' offer the opportunity to check your own requirements on a small data sample. **To download click on the 'Set Name'.**

[details -> [KCDC-Manual](#)]

Navigation: Information, Announcements, FAQs, User Account, Data Shop (New Request, Review Requests, Preselections), Simulations, Spectra, Publications, Report a Bug, Education/Lehre

KASCADE Cosmic Ray Data Centre (KCDC) / Open β

Please login to see this page.

User login Page

Username:

Password:

Do you want to register a new account?

Forgot your password ?

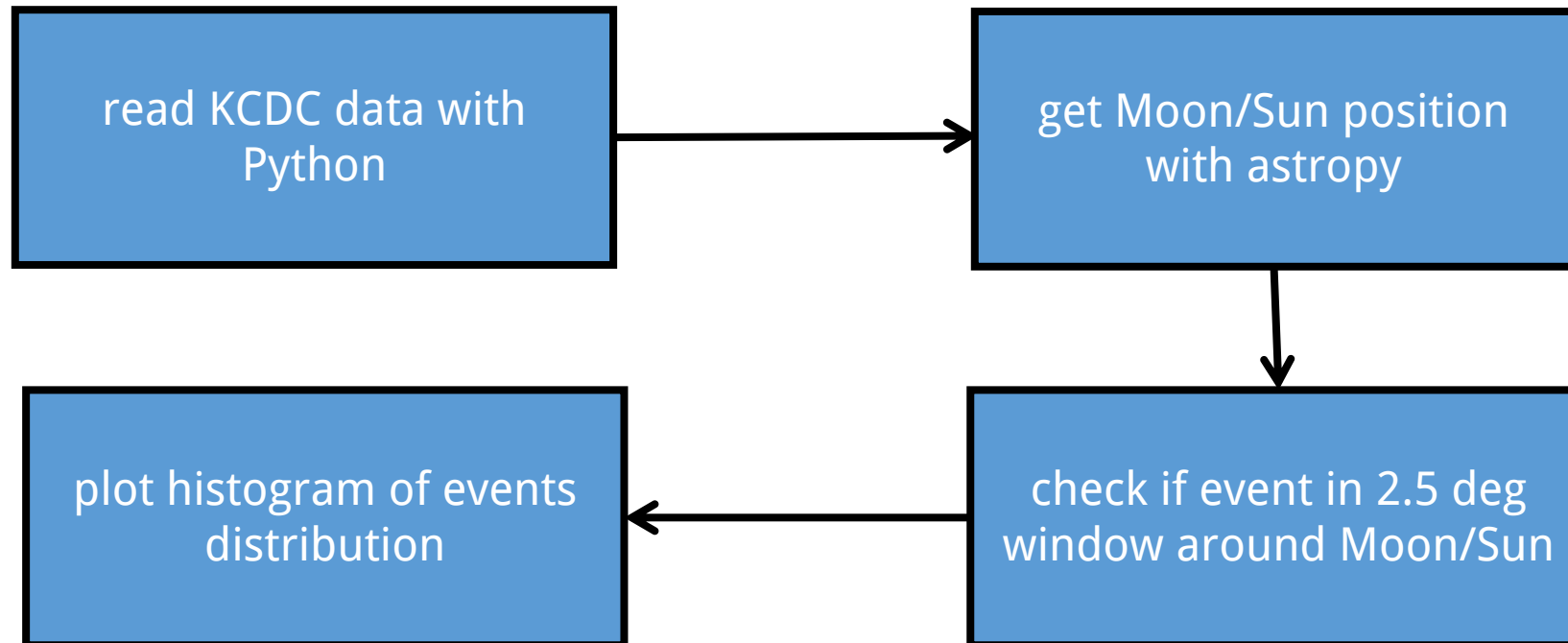
User Login Page

To get access to the KASCADE Data Shop and to the user pages you have to be logged in and you require a valid registration.

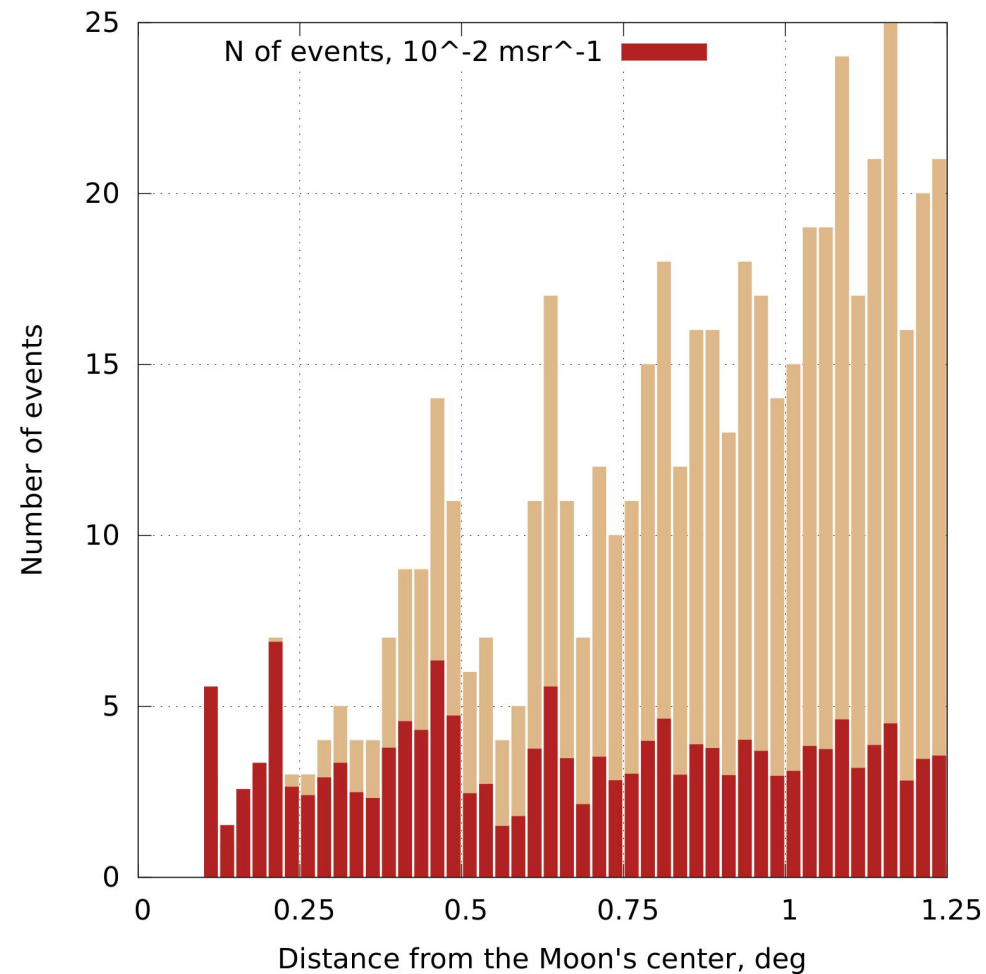
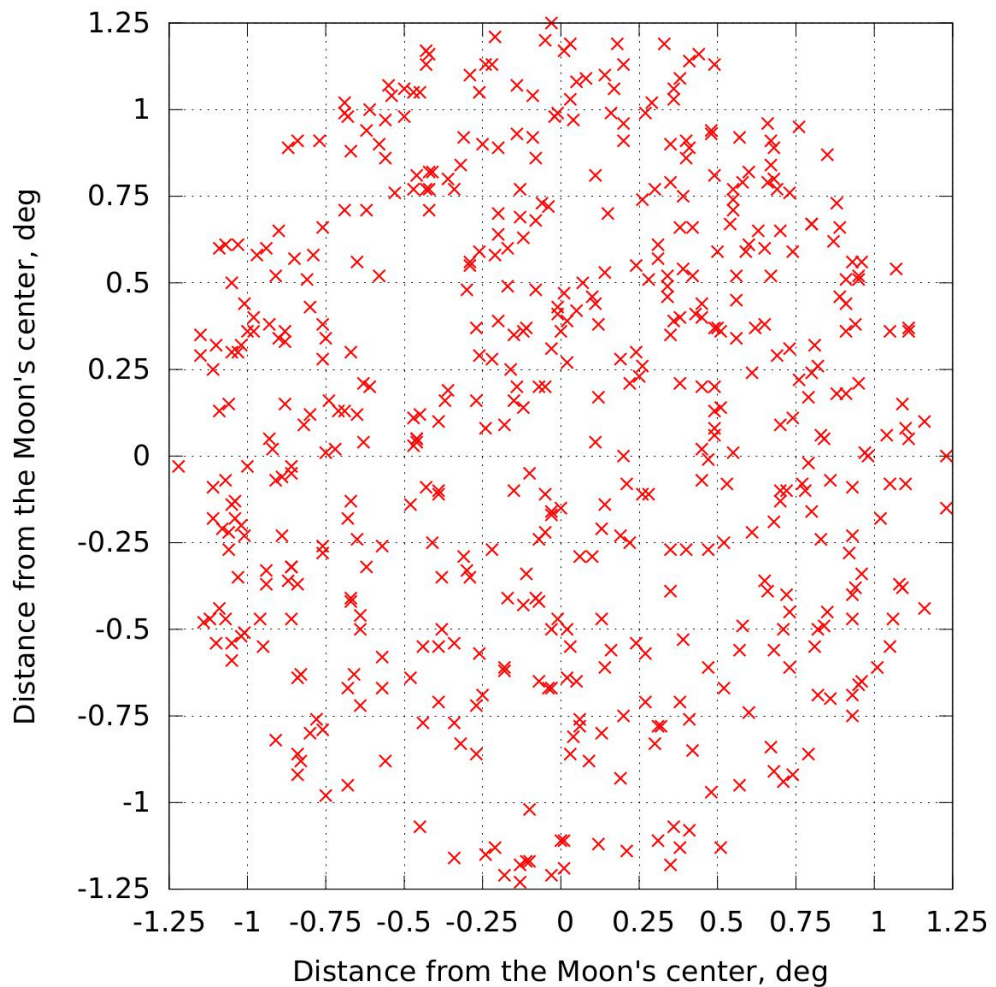
On this web page we collect and store data for optimization purposes by means of cookies which are stored in the internet browsers of the user. Personalized data are used only for communication with the users and will not be passed over to third parties. You can object to the data collection and storage at any time with impact for the future.

details -> [[KCDC Manual](#)]

Data treatment



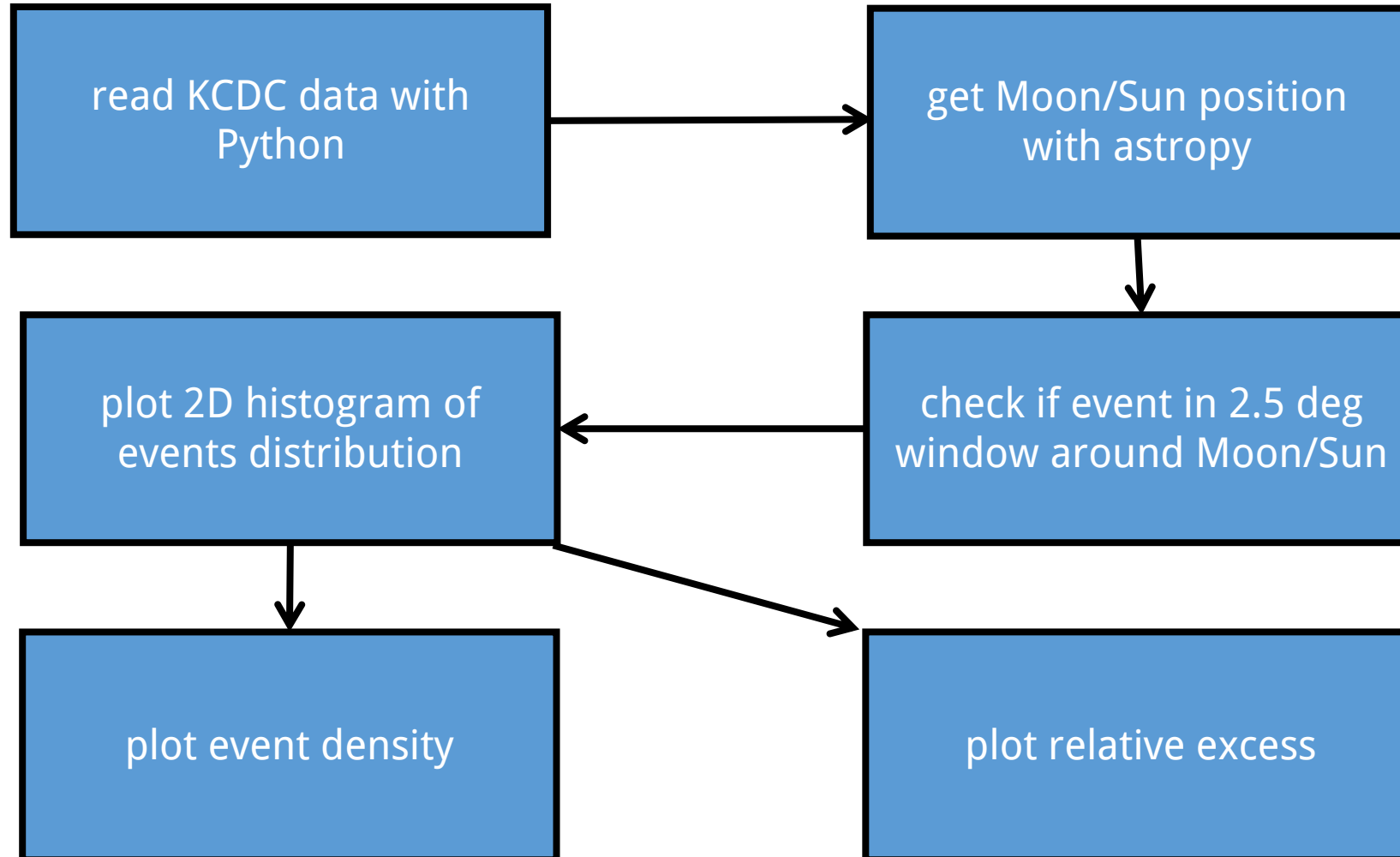
Statistics and Distribution



Statistics

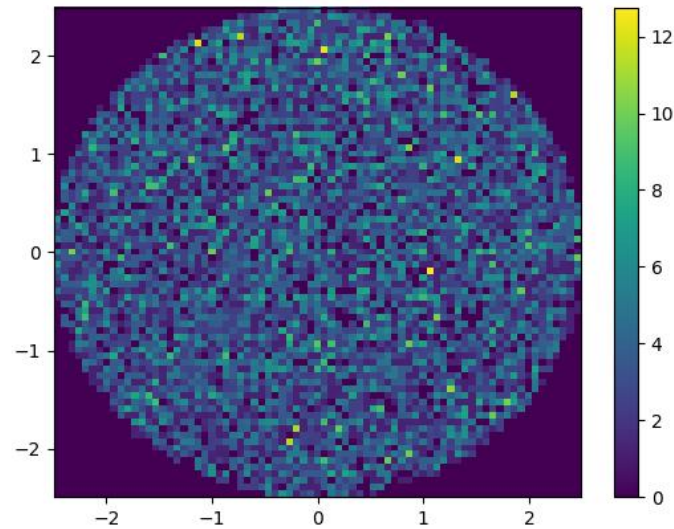
	Dataset 1	Dataset 2
Number of events	145,883,587	287,339,034
Operation period	8.5.1998–20.12.2003	20.12.2003-15.1.2013
Estimated primary energy	10^{13} - 10^{19} eV	
Run number	877 – 4683	4685 - 7417
Runs with Moon	1601 of 4217	

Data treatment: method 2

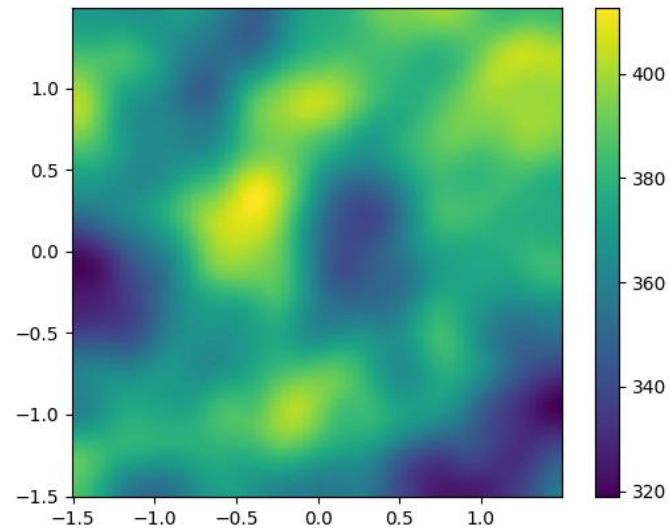


Plotting

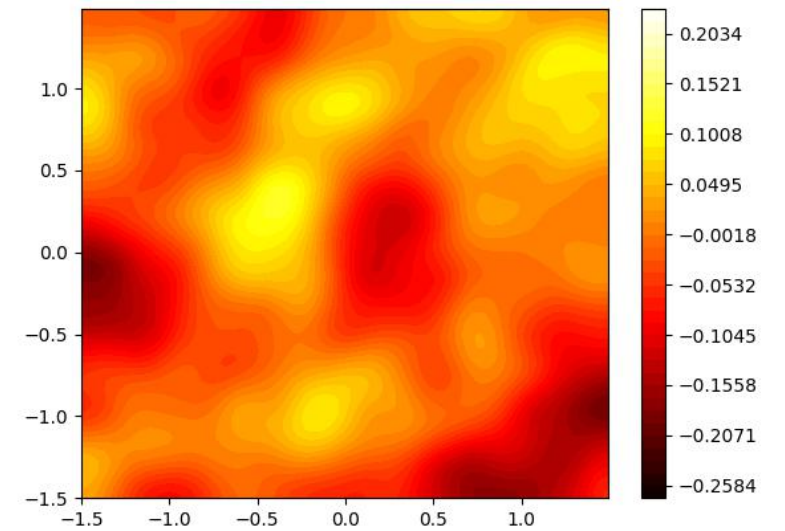
histogram



density



excess



correlation radius 0.5 deg, smoothed gaussian filter with $\sigma = 0.5$ deg

Comparison of datasets

1st dataset:

Event number: 11630

Moon relative excess:

0.171 \pm 0.003

Sun relative excess:

0.122 \pm 0.003

2nd dataset:

Event number: 21273

Moon relative excess:

0.058 \pm 0.002

Sun relative excess:

0.176 \pm 0.003

Merged dataset:

Event number: 32903

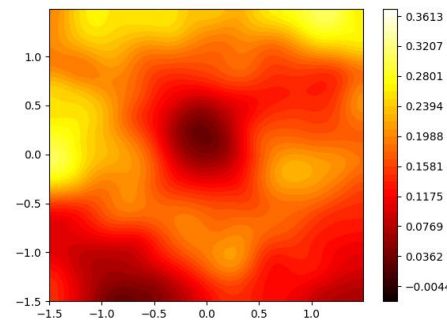
Moon relative excess:

0.096 \pm 0.002

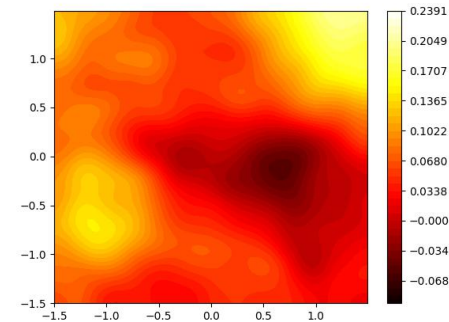
Sun relative excess:

0.163 \pm 0.002

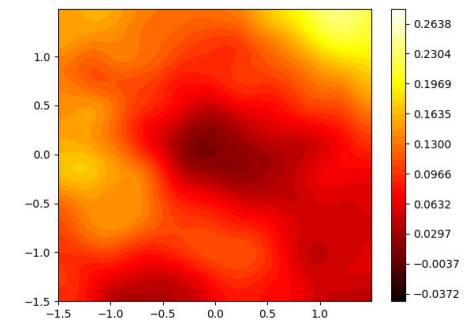
dataset 1



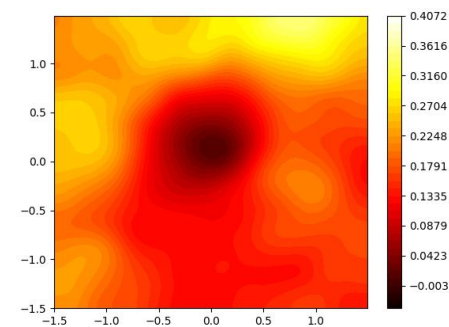
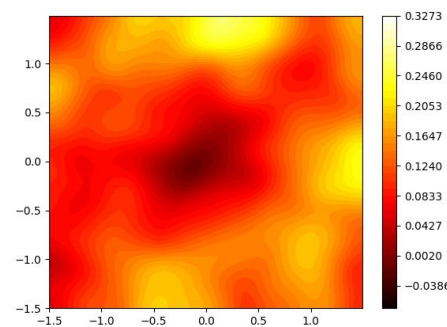
dataset 2



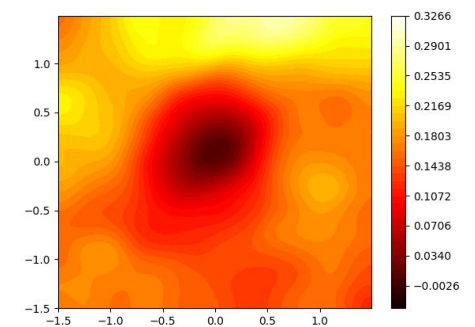
merged



Moon shadow

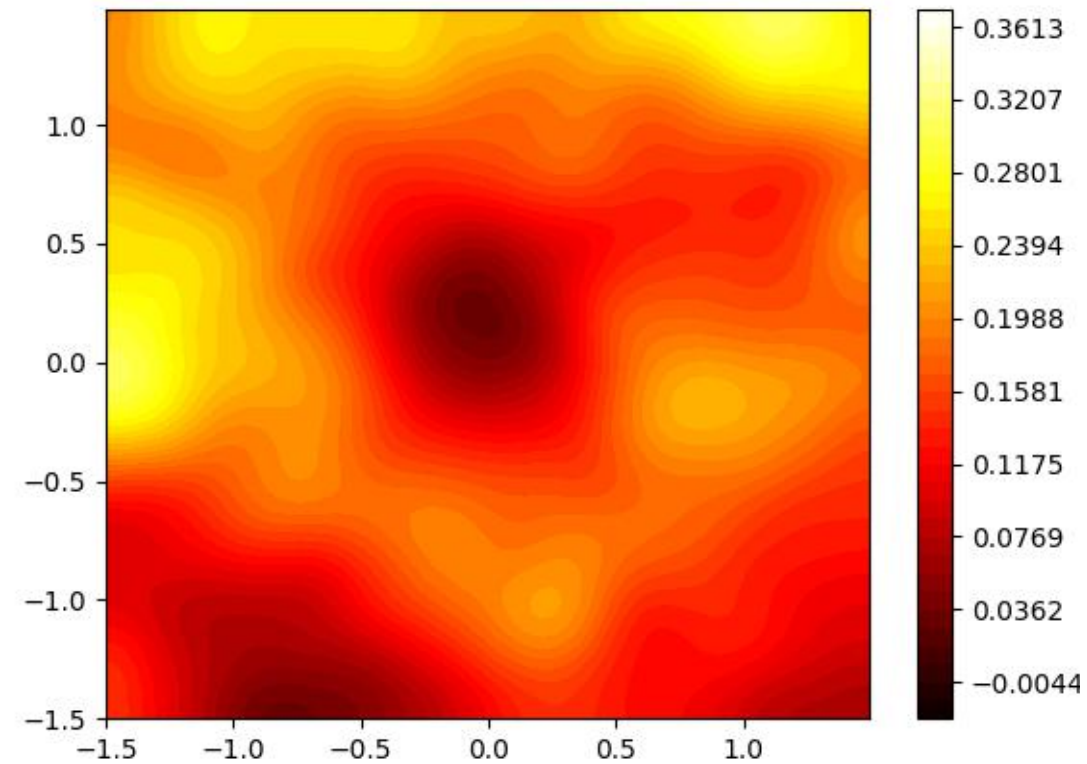


Sun shadow

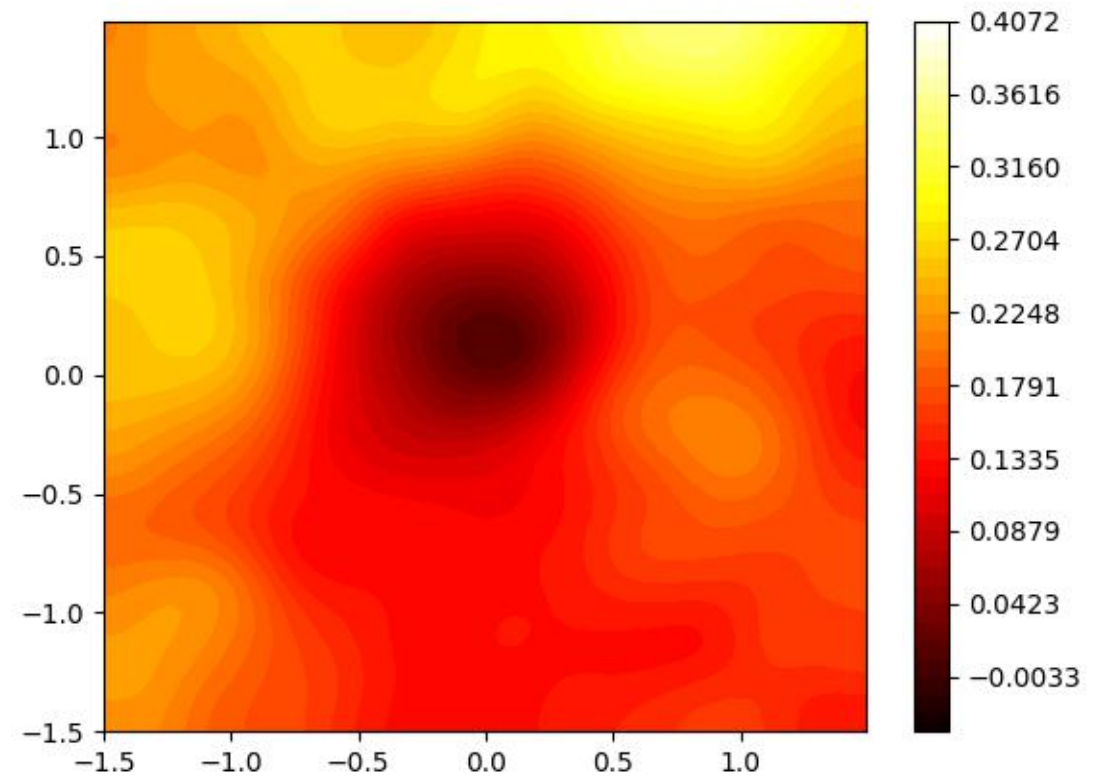


Best results with 2nd method

Moon shadow (dataset 1)

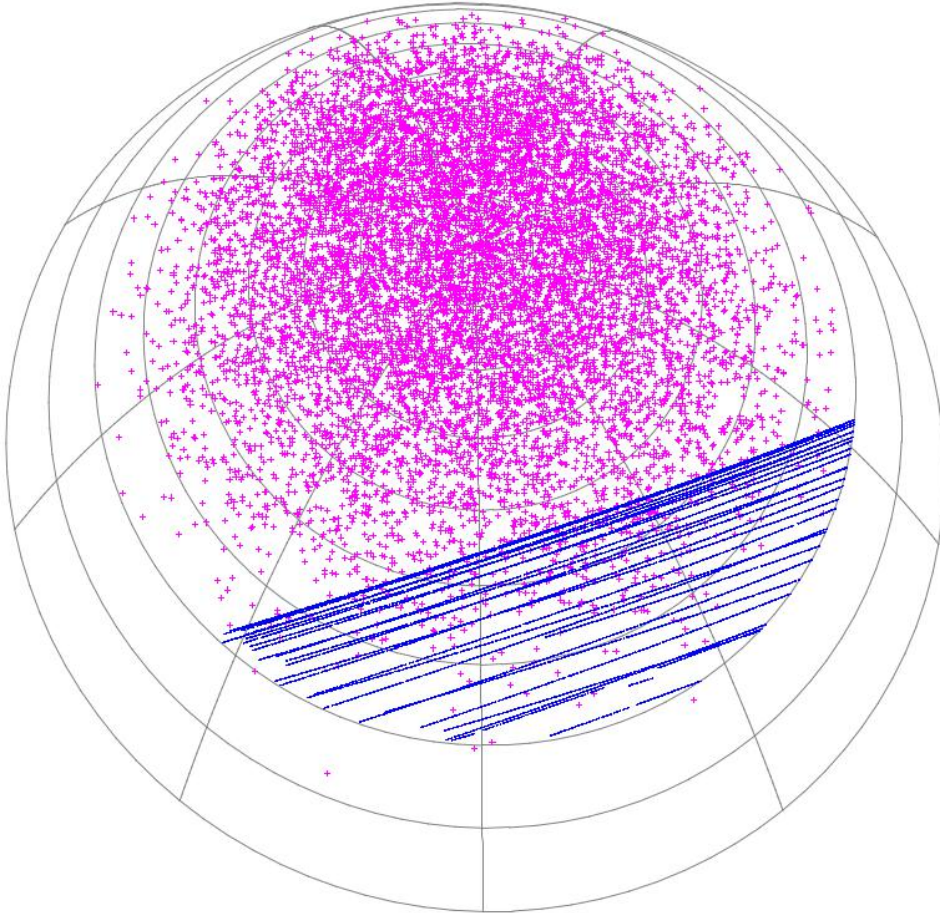


Sun shadow (dataset 2)

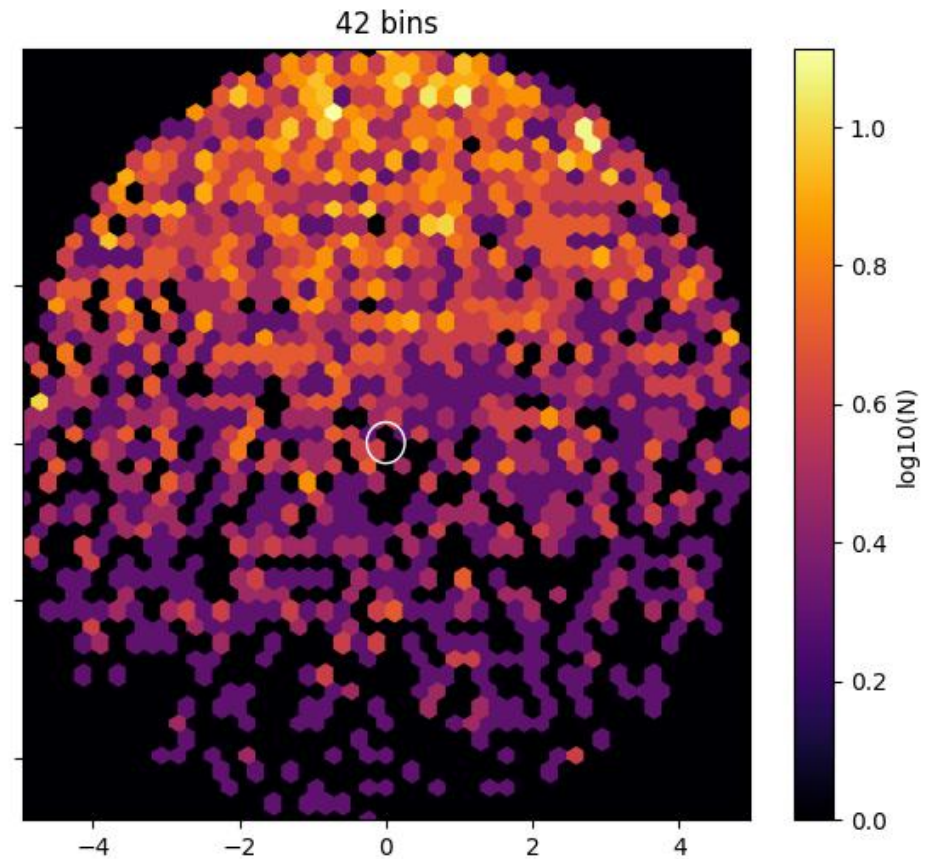


Acceptance correction (in progress ...)

Distribution of events and Moon tracks



5 degree window around Moon



Summary

The analysis of KASCADE data by non-members of collaboration is possible but there is a space for improvement:

1. Datashop is too slow, we have been forced to use preselected data
1. Detector acceptance and other useful quantities are required (the number of observables have to be extended)
2. There are no recommendation regarding suggested software for data analysis (like in H.E.S.S. case)