FD executive report

13/03/2015 - 29/03/2015

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Main issues:

High temperature in Los Leones bays (problem at air conditioning) 3 days off (13-15)

Heavy rain for three days (23-25), DAQ not feasible on 24 and 25 (calibs performed)

Further info:

Raman test (20 min stop in 4 bays to allow measurements along the shift)

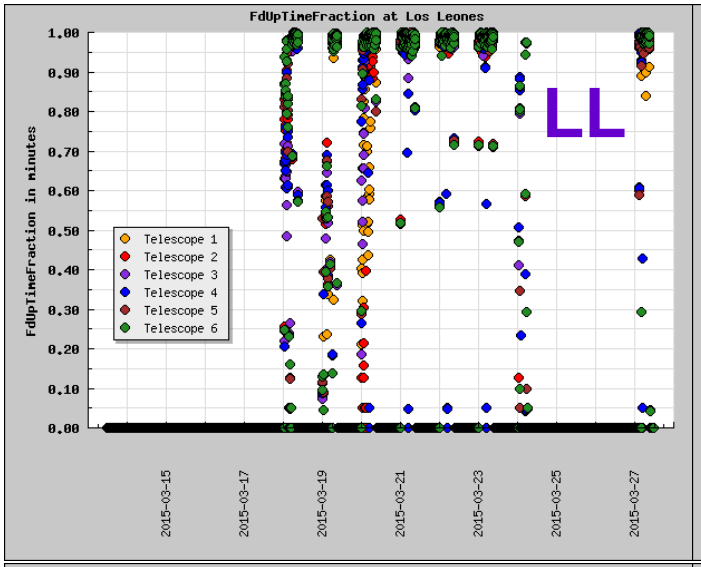
Several series of A calibrations performed before and after the shift
- request from calibs task for time evolution studies

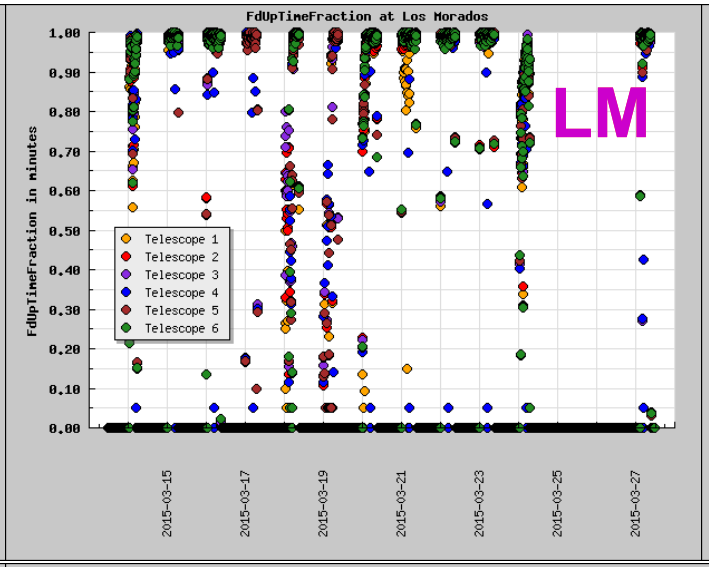
First test of a reconstruction and analysis procedure for data collected along the shift

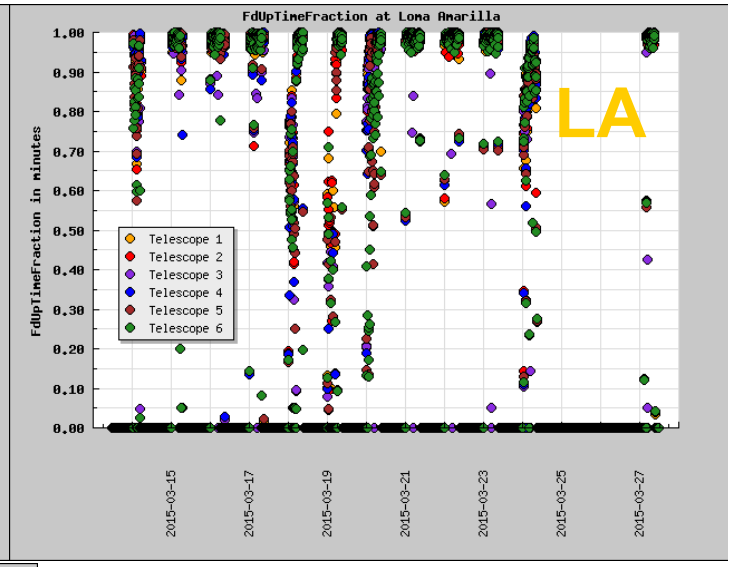
New wiki page! → **Reconstruction and Analysis tools**

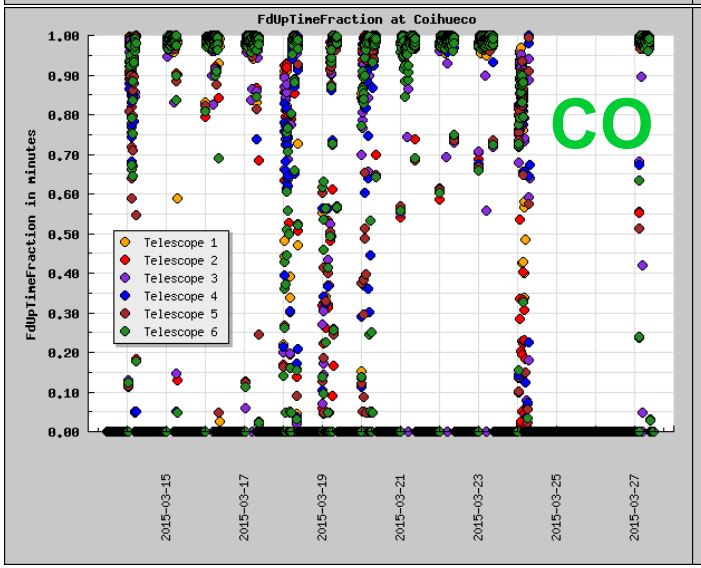
Work done in collaboration with Claudio Di Giulio and Mariano Del Rio

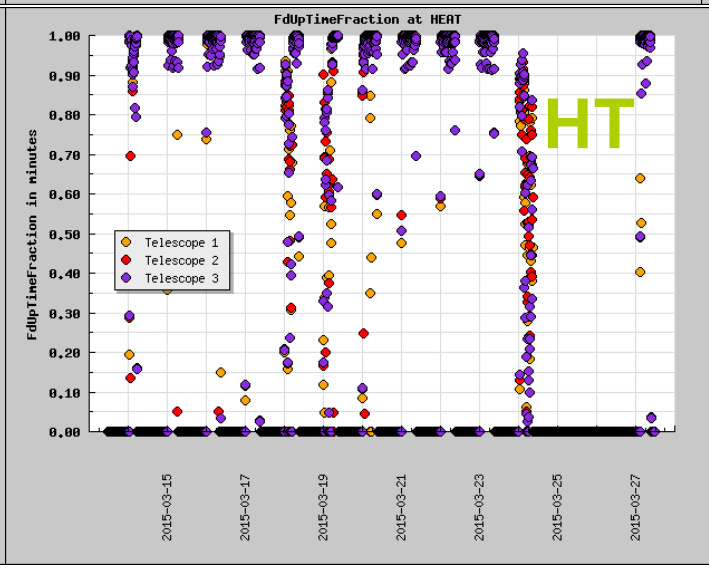
FD Uptime for all sites and telescopes along the shift











Plots extracted from the monitoring database

LL started with 3 days delay (air conditioning problem)
DAQ suspended for two days due to bad weather conditions

WIKI page available for shifters

http://wiki.auger.org.ar/doku.php?id=fd:reconstruction_and_analisys_tools

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Wiki software last updated 28-Jul-2014 - Comments to Ruben Squartini <ruben@auger.org.ar>

Data Reconstruction and Analysis Tools

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  - Goal
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  - Along the shift
  - Hybrid Analysis (possible after 3-4 days from DAQ)

edit

Goal

Perform a preliminary analysis of the data being collected along the current shift with the aim of

1. addressing possible data quality issues
2. identifying the most interesting events in a shift
3. prepare a short executive report at the end of each shift with the above info.

edit

Action

Use an Offline based simplified reconstruction, without connection to databases (i.e. using fixed Fd calibration constants and parametric models for modeling the Atmosphere response)

edit

Every night

STEP 1 : Fetch Fd data. Copy Fd data from GINA to GINA-NX.

a) On GINA-NX (in /home/auger), remove the directory TodaysEyes, just once at the beginning of the night.

b) On GINA-NX (in /home/auger), execute the command :"scp -rp auger@192.168.2.7:/home/auger/TodaysEyes ." (pass: auger)

This action can be performed during the night for studies on events currently being collected. And of course at the end of the night after the runs have been stopped.

Alternatively, Fd data can be retrieved from the /Raid/data partition with a latency of 1-2 days. Example: Fd data of March 18 for all eyes are in /Raid/data/Fd/*/eyepc/2015/03/18/data/run*.root

STEP 2 : Reconstruct data

a) On GINA-NX (in /home/auger/offline) execute the command :"source setvars_v2r9-oct2013.sh". Do that anytime you start a new terminal if you wish to use offline tools.

b) On GINA-NX go to /home/auger/offline/FdDataReconstruction and check that the path in the file EventFileReader.xml is correctly set to /home/auger/TodaysEyes/*/data/run*.root. This is the area where you have just copied the Fd data collected in the current night (see STEP 1.a).

c) Go to /home/auger/offline/FdDataReconstruction. To reconstruct the full data set just type "./userAugerOffline >& log_full_16_03_2015.log &". This command will start the reconstruction of data (HEAT data will not be reconstructed so far) and put the ascii output in the logfile, we suggest a name with the date of the day in which the shift has started (March 16 2015 in this case).

Check that the log file is progressing (i.e. that the job is running). Do for example "tail -f log_full_16_03_2015.log" . Ctrl-C to exit from this status.

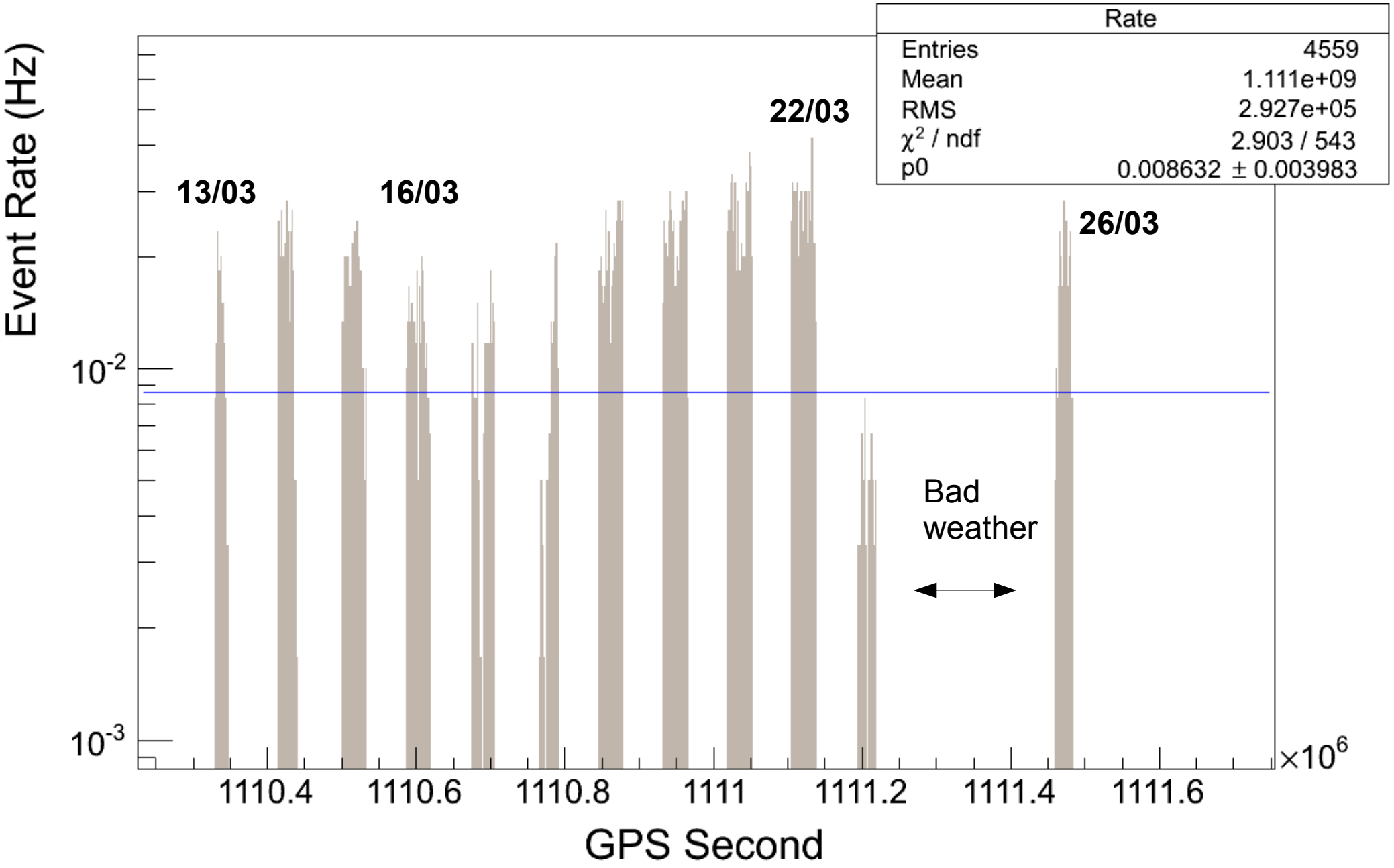
Let it run after the shift night. It takes approx 1.5 hours for the entire dataset.

You may also perform **a)**, **b)** and **c)** during the night while running (copied files will be not properly closed but offline should recover the written part).

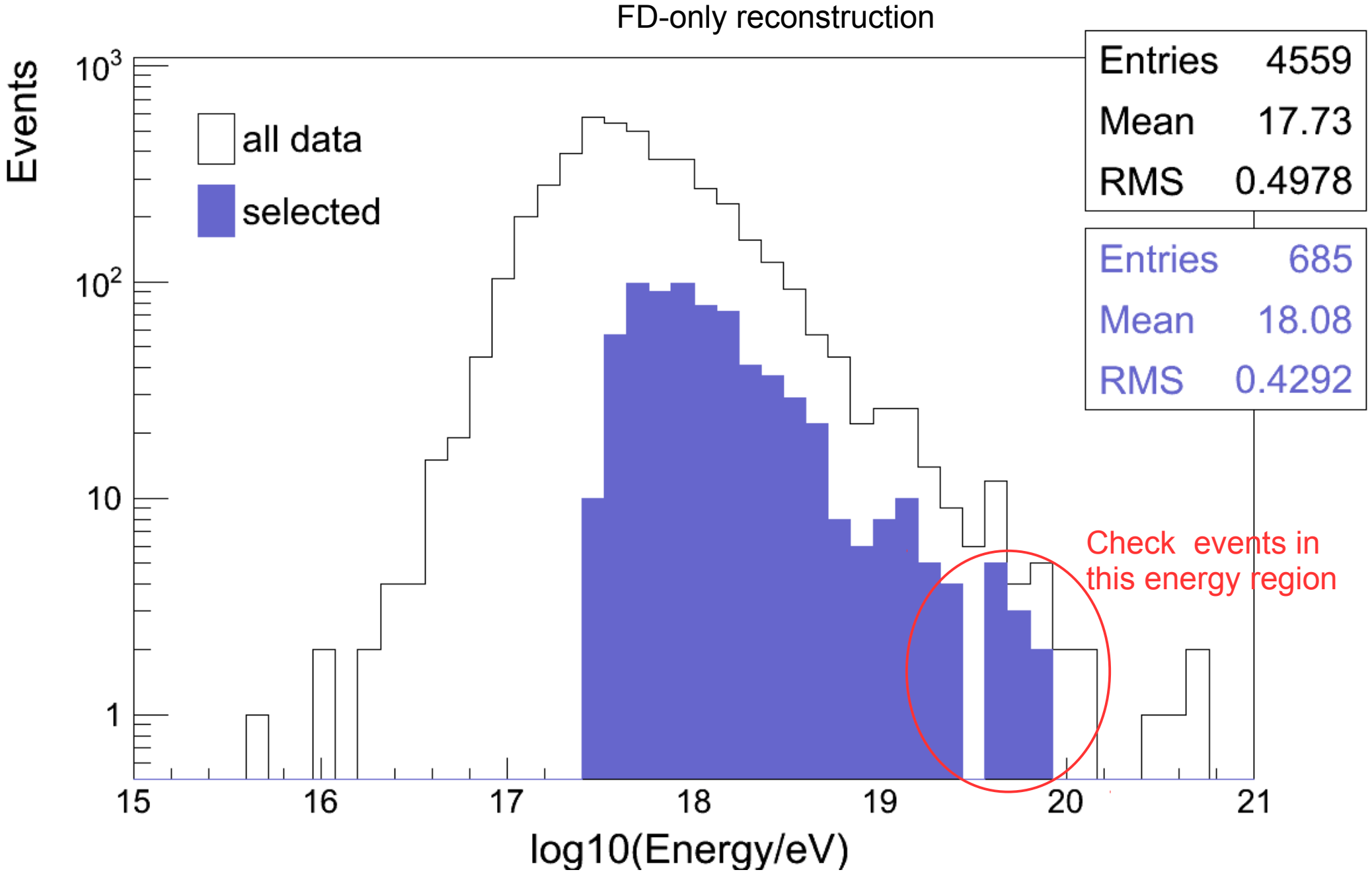
Find in page | Highlight All | Match Case

Monitoring the rate of T3 events: overall slightly lower than average (~1.2 10^{-2} Hz)

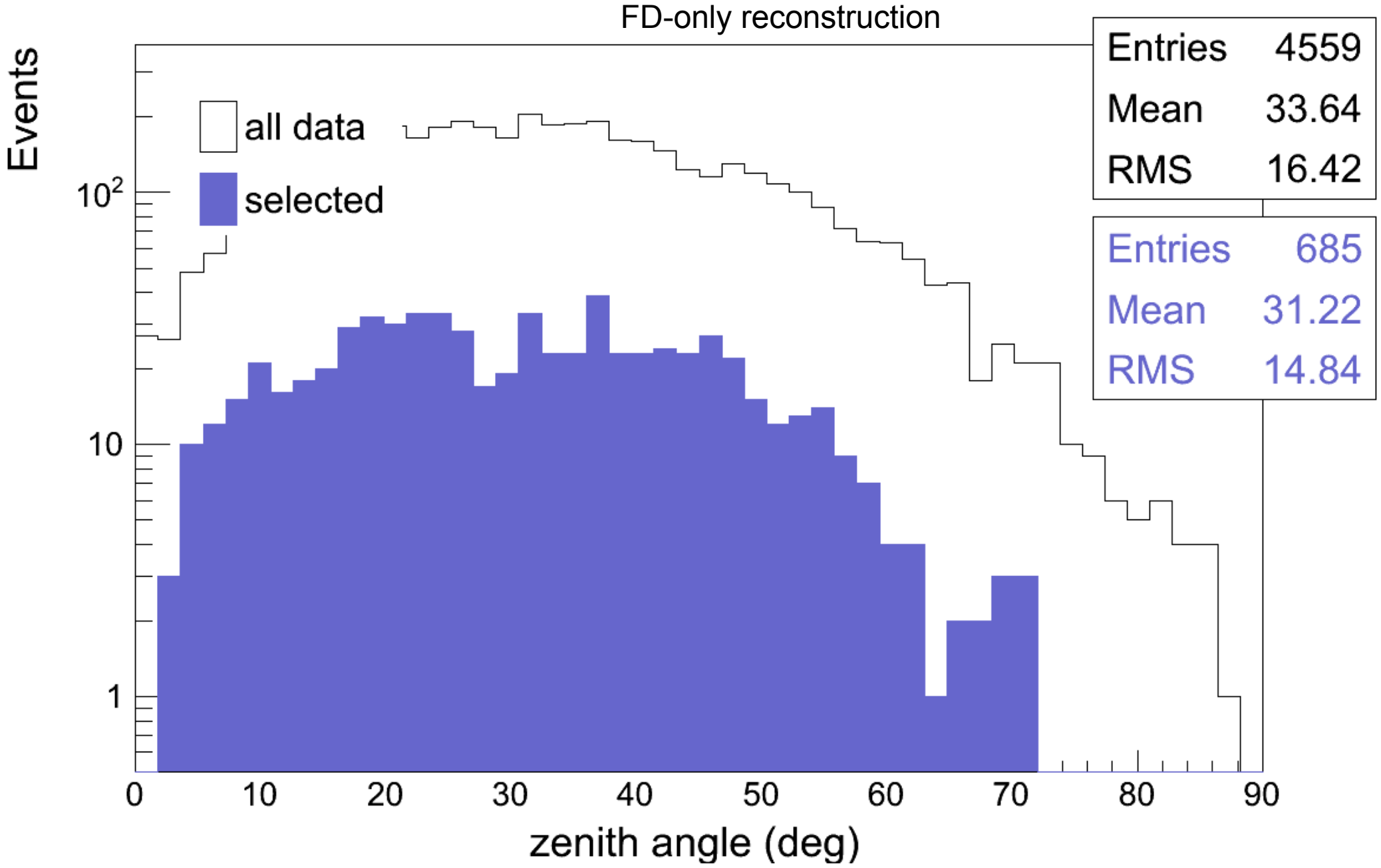
Days with highest rate (best weather conditions) : from 19/3 to 22/3



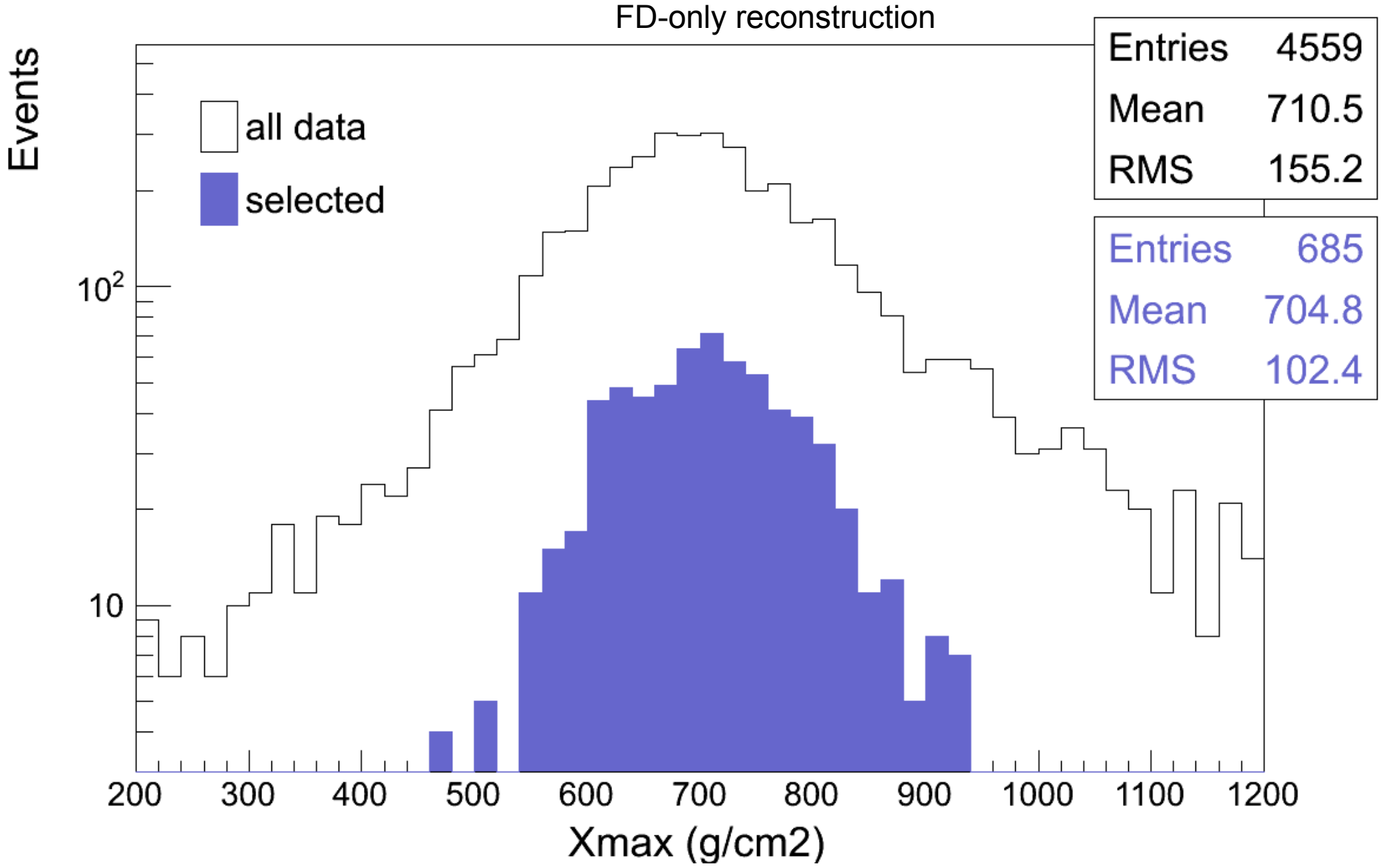
Checking the energy distribution of all and selected events
(loose selection rules)



Checking the zenith distribution of all and selected events
(loose selection rules)



Checking the Xmax distribution of all and selected events
(loose selection rules)



Short collection of selected events

As soon as merged data were available during the shift (3-4 days after their acquisition), hybrid reconstruction was performed
We show here 3 nice events (energy ~ 20 EeV) collected along the shift. Two of them are stereos (i.e. both eyes satisfy our basic selection criteria)

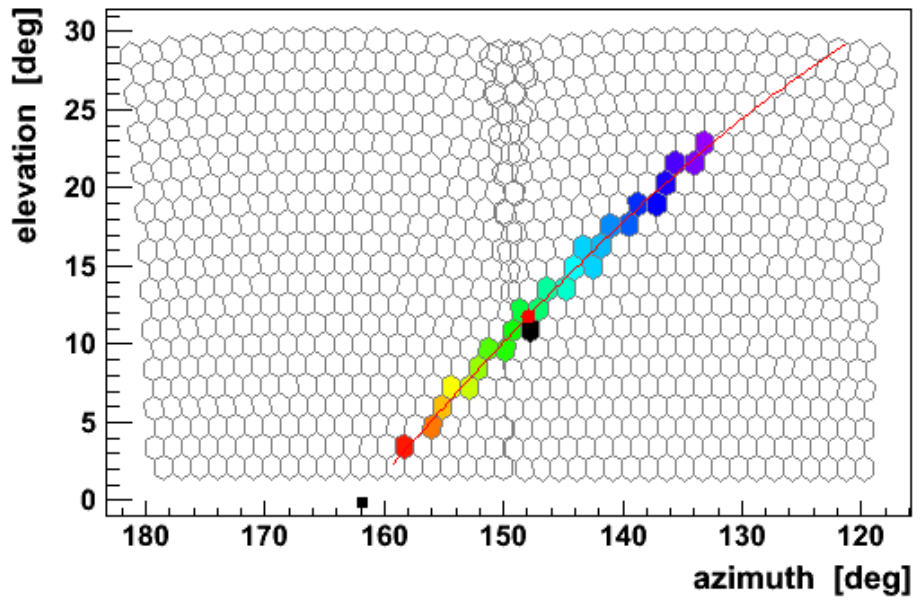
Apparently we have other high energy events (some of them most likely mis-reconstructed)

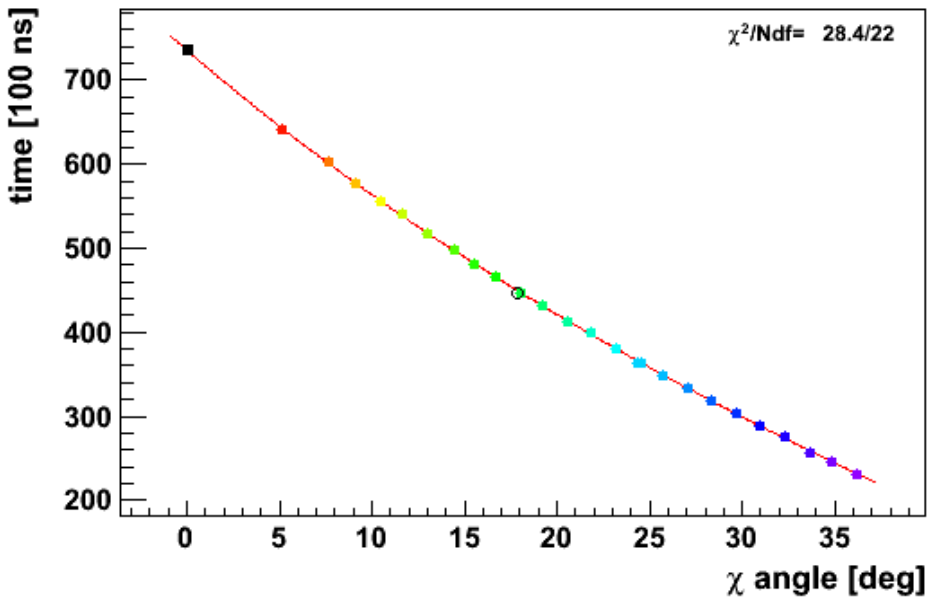
We attach the ADST of all events above log10(E/ev) > 19.2

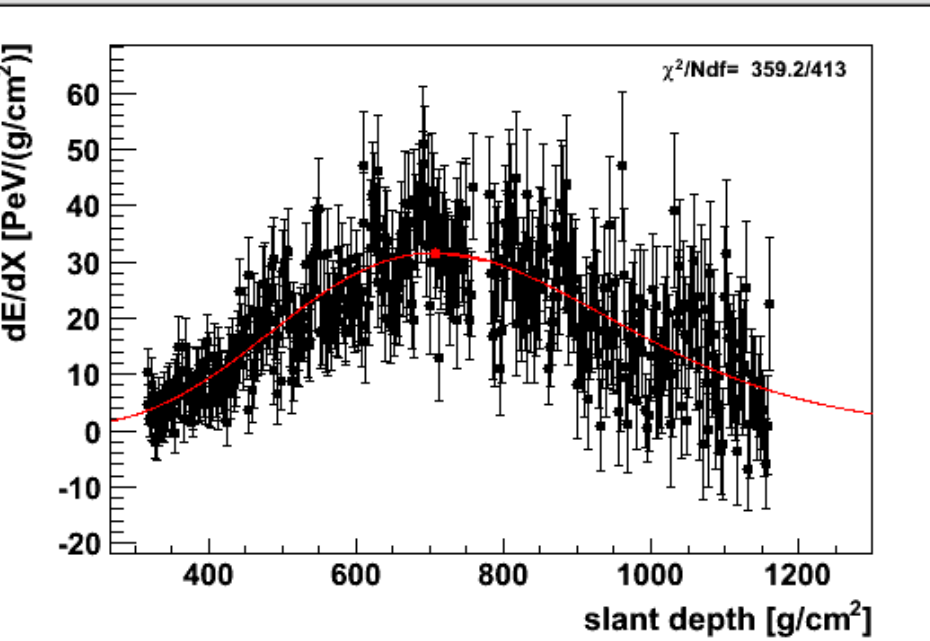
CAVEAT !
Reconstruction is performed using fix calibration constants and parametric models for the description of the atmosphere.

File FD SD MC Help

Auger | Los Leones | Los Morados | Loma Amarilla | Coihueco | Heat | SD | Selection







Event Info | Pixels

run 4543, event 585
time stamp: 1110332063 s 587241765 ns
Trigger: 'Physics - Int or L/R trigger', 'Shower Candidate'
in Los Morados mirror 5 6 (in DAQ: 1 2 3 4 5 6)

hybrid geometry, station 289 (TOT), ΔSP = 142 m

(θ,ϕ) = (51.0±0.5, 113.3±0.5) deg
(x,y) = (2.64±0.10, -21.75±0.11) km
dca to Eye = 24.77 ± 0.03 km

$E = (2.05 \pm 0.08) \times 10^{19}$ eV
Xmax = 708 ± 6 g/cm^2
dEdXmax = 31.58 ± 0.63 PeV/(g/cm^2)
$(\lambda, X0)$ = (60±8,-150±96) g/cm^2
Cherenkov-fraction = 6%, mva=67 deg.

Mie attenuation: model
LIDAR: no data ; CloudCam: no data
molecular profile: model; time correction: good

profile: (•) dE/dX(X) ( ) dE/dX(s) ( ) N(X) ( ) light 0

options: [ ] resid. [ ] all pix. [ ] all SD

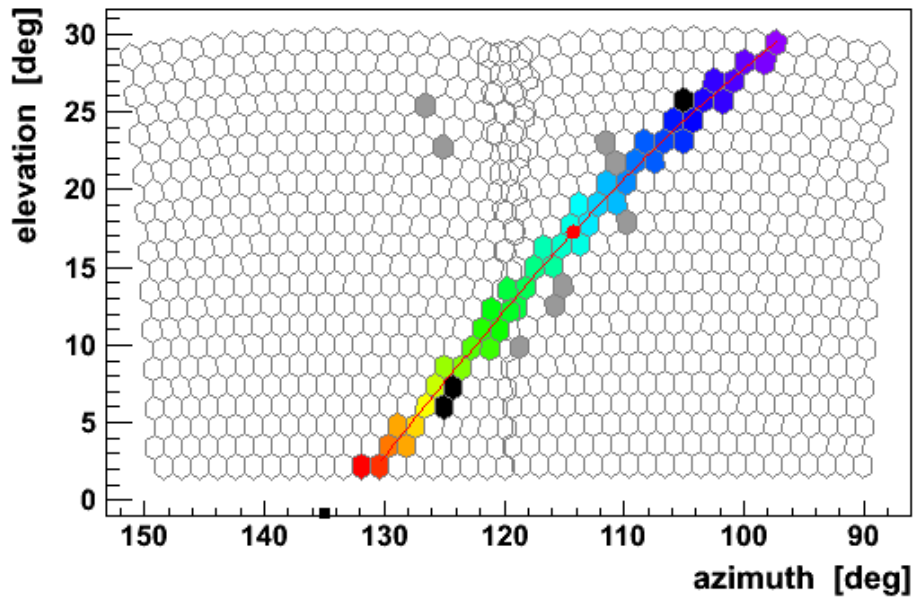
colors: (•) t ( ) Q ( ) logQ ( ) clouds

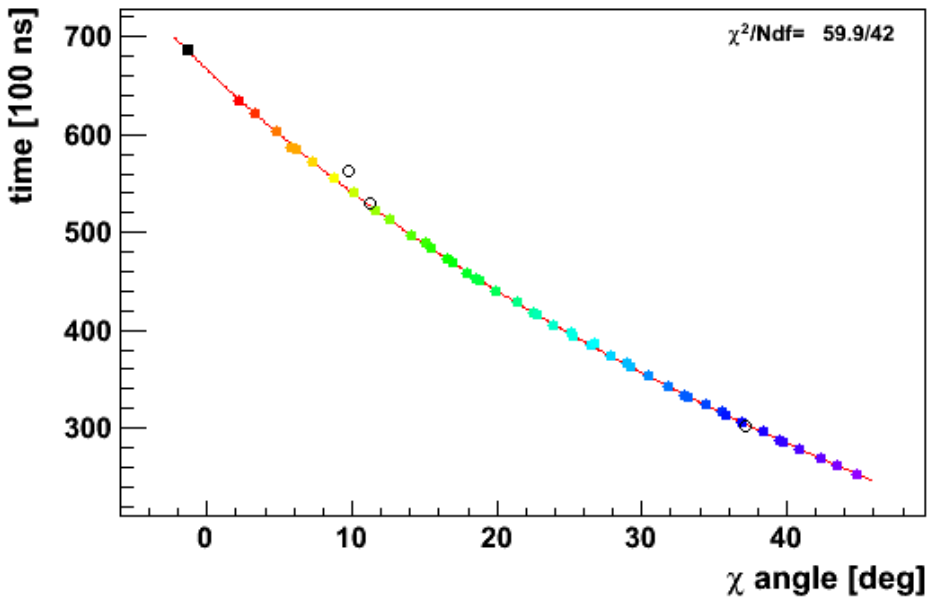
Animate

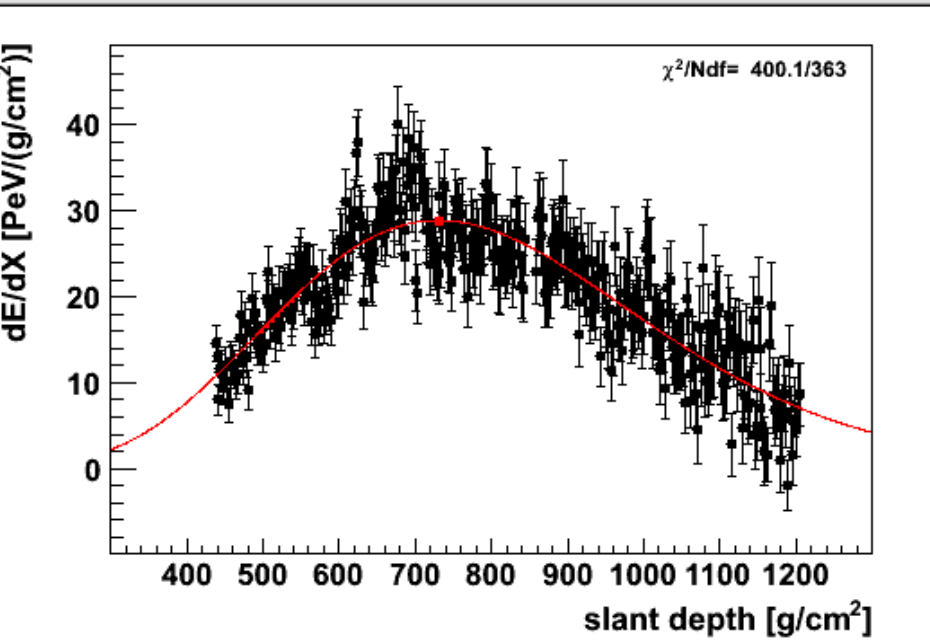
2015/3/14 01:34:07 Auger 201507207798 SD 31906582 FD 2/4543/585

File FD SD MC Help

Auger | Los Leones | Los Morados | Loma Amarilla | Coihueco | Heat | SD | Selection







Event Info | Pixels

run 5725, event 5527
time stamp: 1110604607 s 353008045 ns
Trigger: 'Physics - Int or L/R trigger', 'Shower Candidate'
in Coihueco mirror 4 5 (in DAQ: 1 2 3 4 5 6)

hybrid geometry, station 935 (TOT), ΔSP = 605 m

(θ,ϕ) = (50.0±0.2, 255.8±0.3) deg
(x,y) = (-16.33±0.02, 19.51±0.05) km
dca to Eye = 14.96 ± 0.03 km

$E = (2.00 \pm 0.07) \times 10^{19}$ eV
Xmax = 731± 5 g/cm^2
dEdXmax = 28.91± 0.33 PeV/(g/cm^2)
(λ,X0) = (72±9,-76±98) g/cm^2
Cherenkov-fraction = 7%, mva=68 deg.

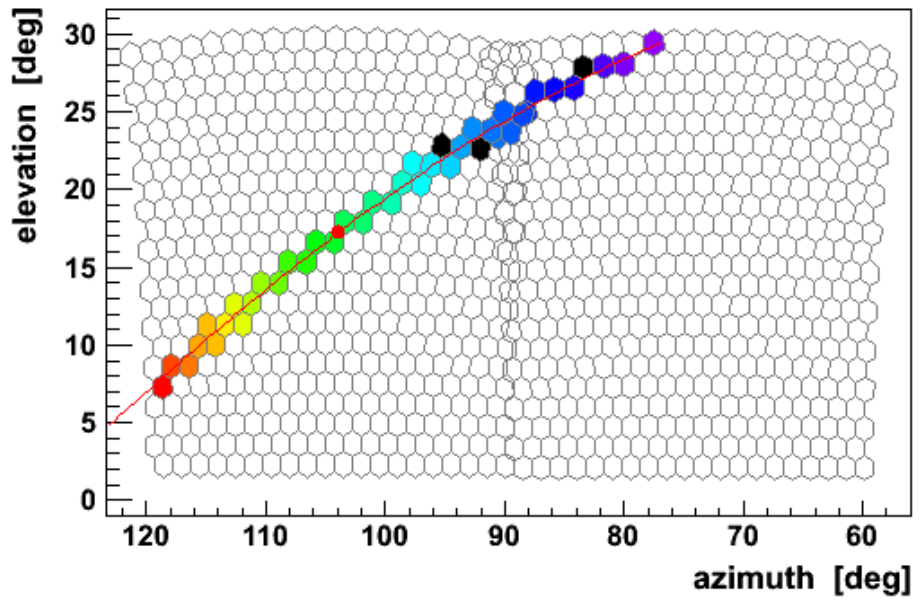
Mie attenuation: model
LIDAR: no data ; CloudCam: no data
molecular profile: model; time correction: good

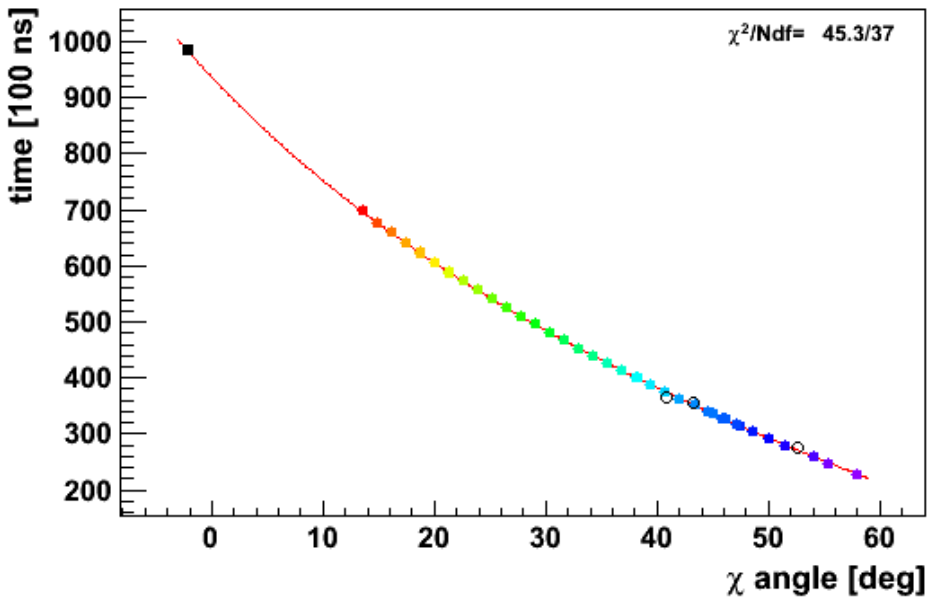
profile: dE/dX(X) dE/dX(s) N(X) light 0
options: resid. all pix. all SD
colors: t Q logQ clouds
Animate

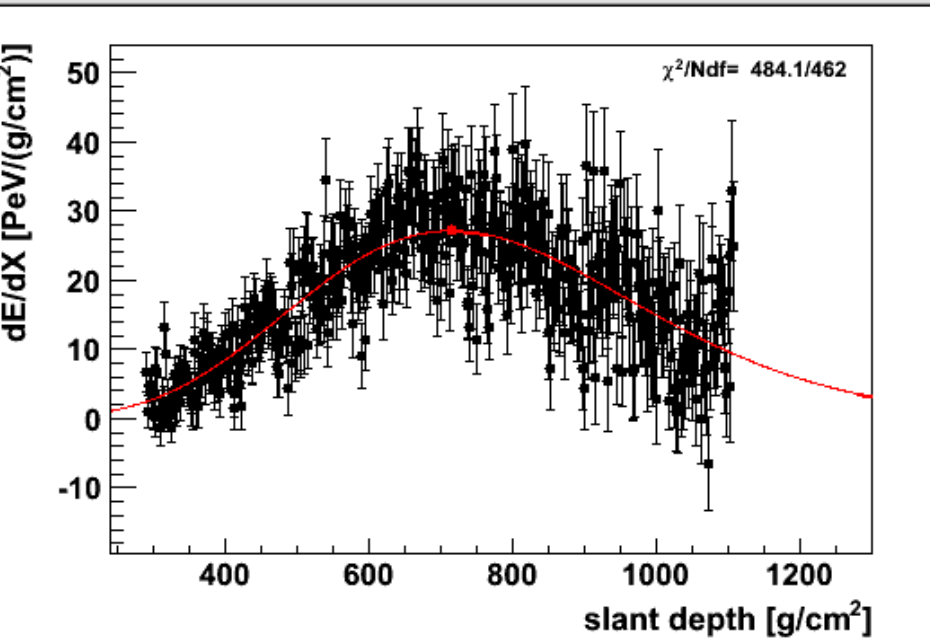
2015/3/17 05:16:31 Auger 201507511519 SD 31957375 FD 4/5725/5527 3/3031/4698

File FD SD MC Help

Auger | Los Leones | Los Morados | Loma Amarilla | Coihueco | Heat | SD | Selection







Event Info | Pixels

run 5734, event 20139
time stamp: 1110873349 s 244834665 ns
Trigger: 'Physics - Int or L/R trigger', 'Shower Candidate'
in Coihueco mirror 3 4 (in DAQ: 1 2 3 4 5 6)

hybrid geometry, station 1192 (TOT), ΔSP = 557 m

(θ,ϕ) = (58.8±0.2, 252.6±0.4) deg
(x,y) = (-9.85±0.03, 20.22±0.12) km
dca to Eye = 20.42 ± 0.03 km

$E = (1.85 \pm 0.07) \times 10^{19}$ eV
Xmax = 715 ± 6 g/cm^2
dEdXmax = 27.17 ± 0.43 PeV/(g/cm^2)
$(\lambda, X0)$ = (62±8,-188±95) g/cm^2
Cherenkov-fraction = 4%, mva=57 deg.

Mie attenuation: model
LIDAR: no data ; CloudCam: no data
molecular profile: model; time correction: good

profile: (•) dE/dX(X) ( ) dE/dX(s) ( ) N(X) ( ) light 0

options: [ ] resid. [ ] all pix. [ ] all SD

colors: (•) t ( ) Q ( ) logQ ( ) clouds

Animate

2015/3/20 07:55:33 Auger 201507815636 SD 32009419 FD 4/5734/20139 3/3035/20921