Run Quality and Run Selection

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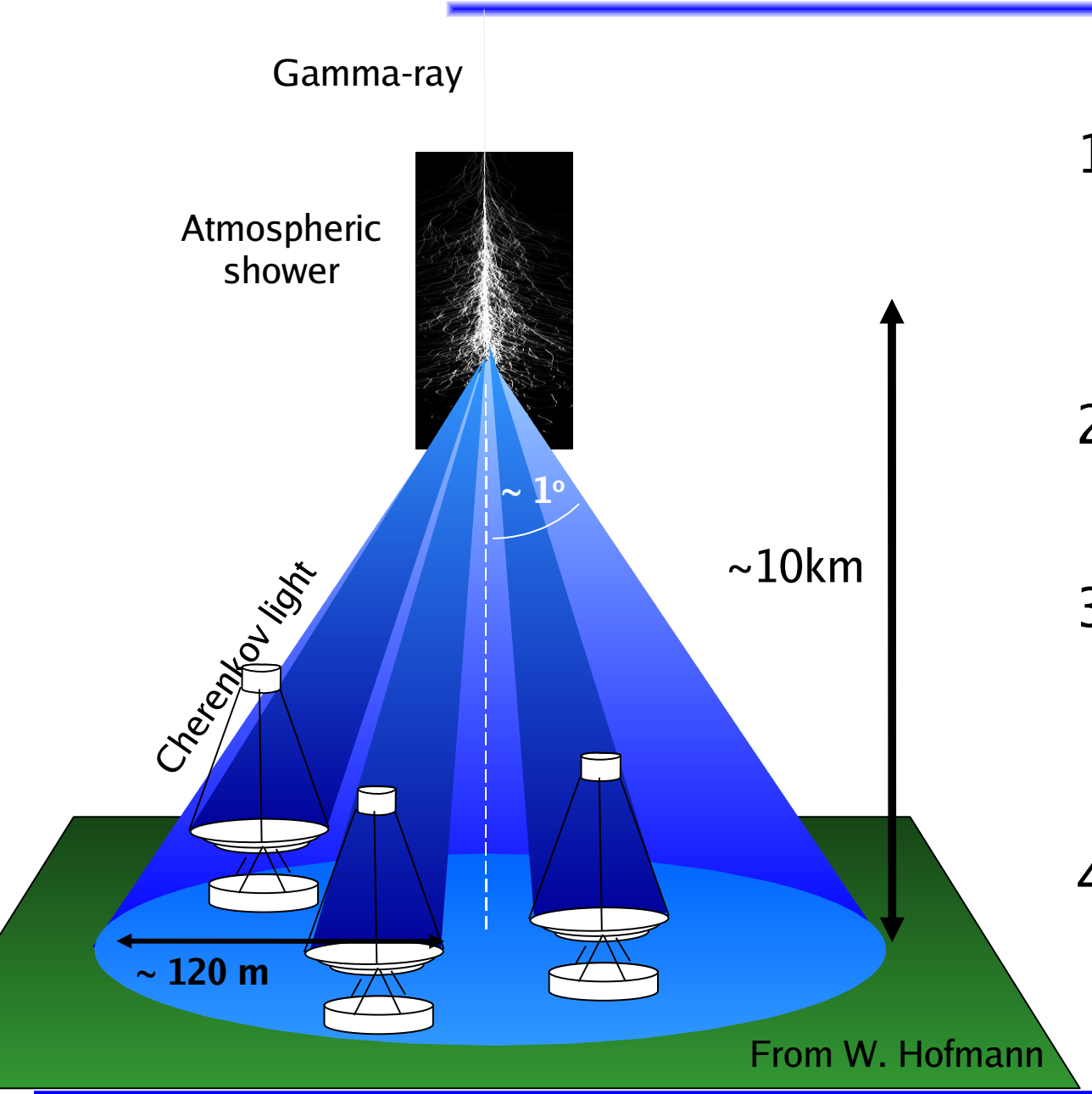
Run quality



1) Atmospheric quality
   - Stability
   - Absolute transparency
2) Telescope accuracy
   - Pointing accuracy
3) Camera
   - Working channels
   - Individual trigger rate
4) Array trigger rate

Criteria

Main variables

- Telescope trigger rate
- Central trigger rate
- Number of "broken pixels" (temporary non-usable pixels)

Secondary (optional) variables

- Dead time fraction
- Tracking accuracy
- Data from radiometers, LIDAR, weather station
- Level of night sky background (NSB)

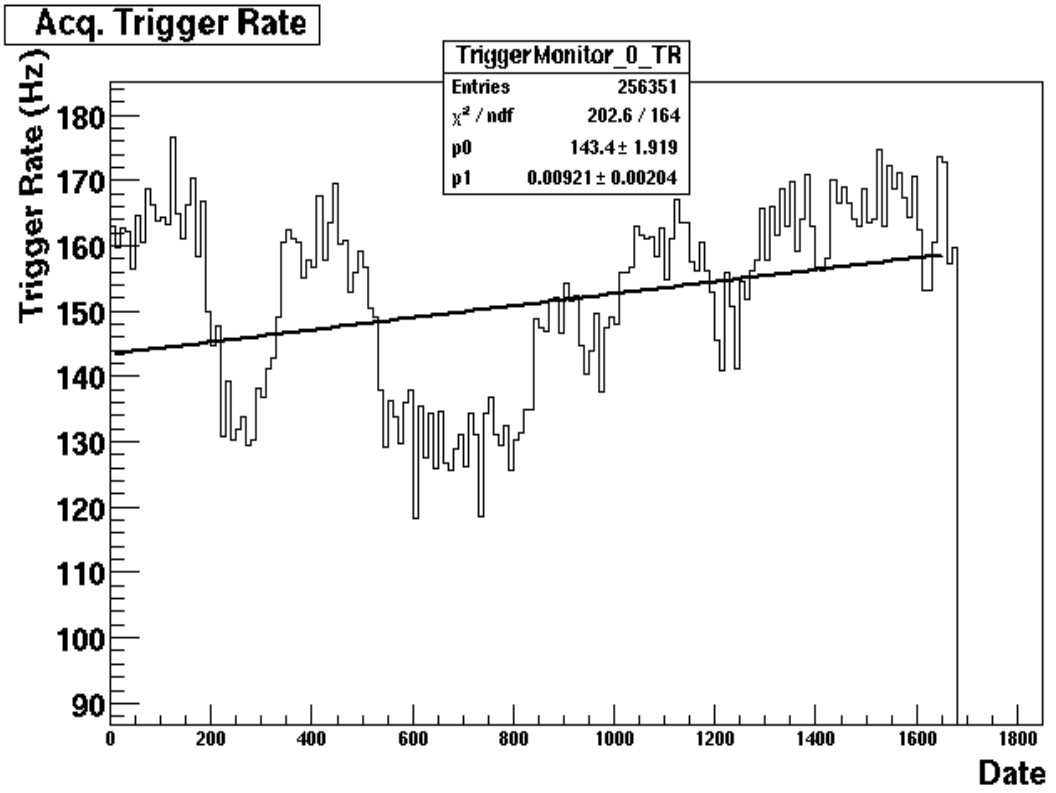
Trigger data

Stability of the trigger rate per run

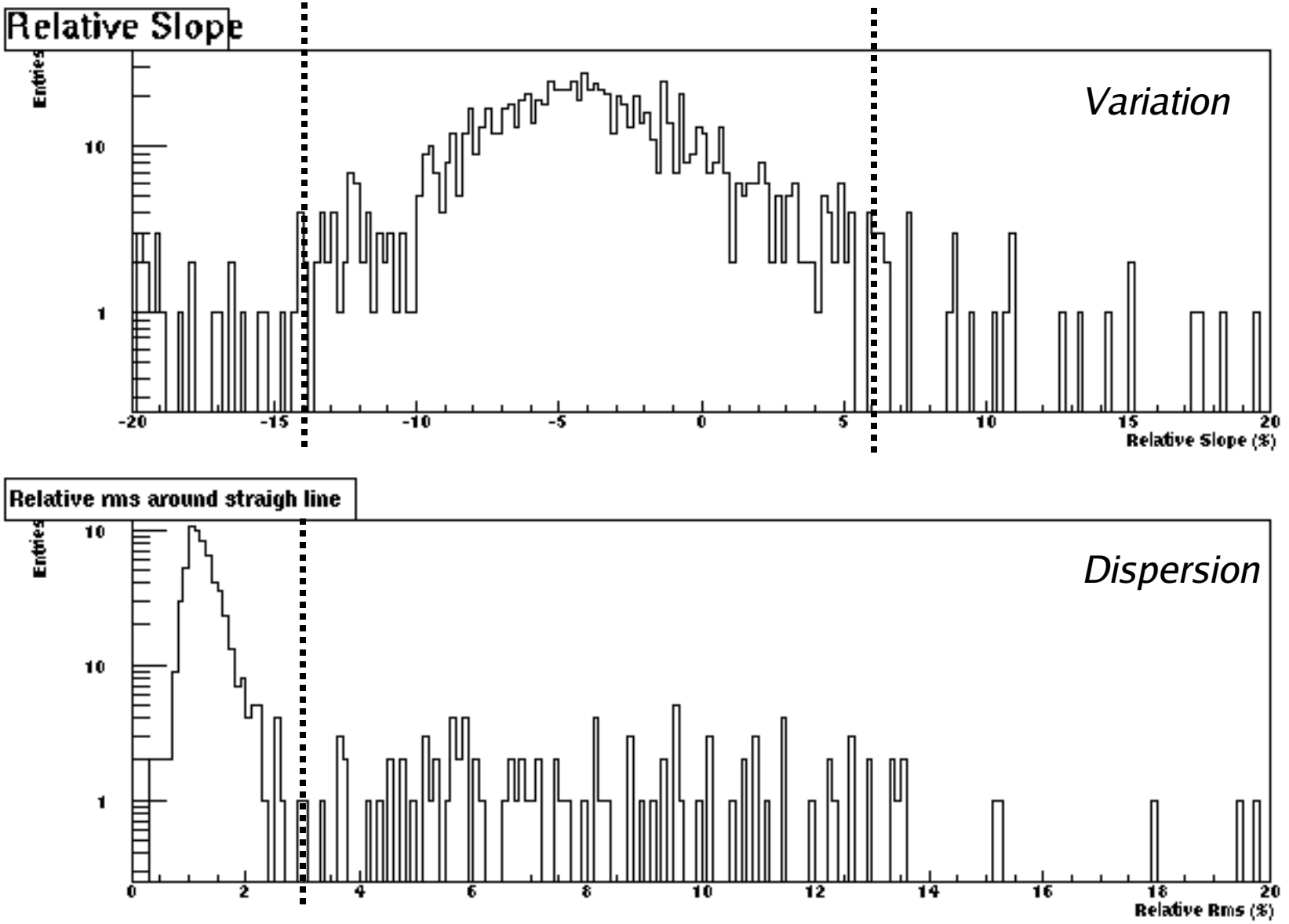
Straight line fit on:

- Acquisition rate
- "True" rate

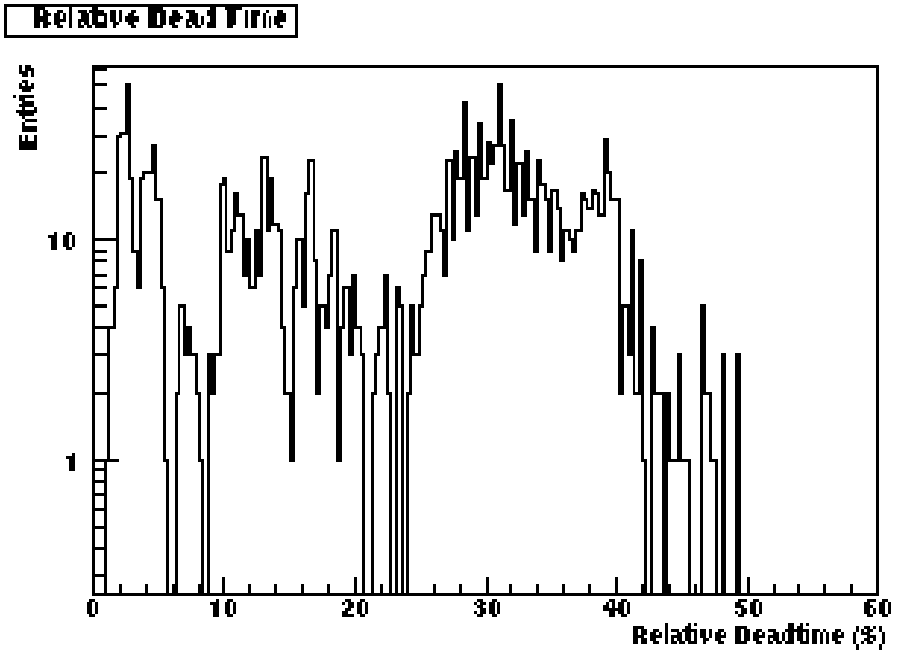
- Relative slope or *Variation*: p1/<rate>*100.
- *Dispersion*: RMS around this line

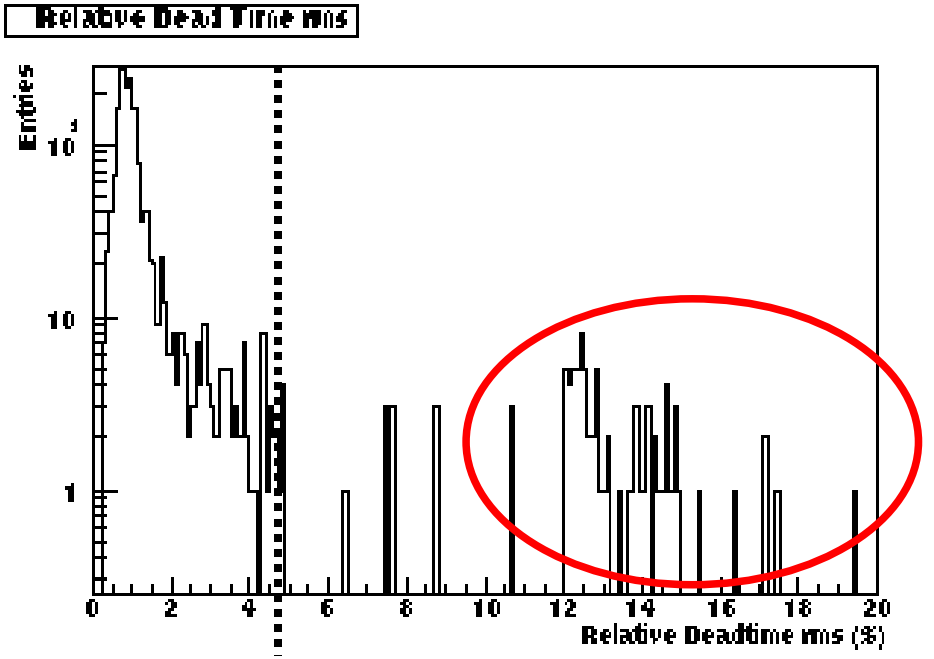


Trigger data (2)



Trigger data (3)





Trigger data (4)

Mean value of the trigger rate

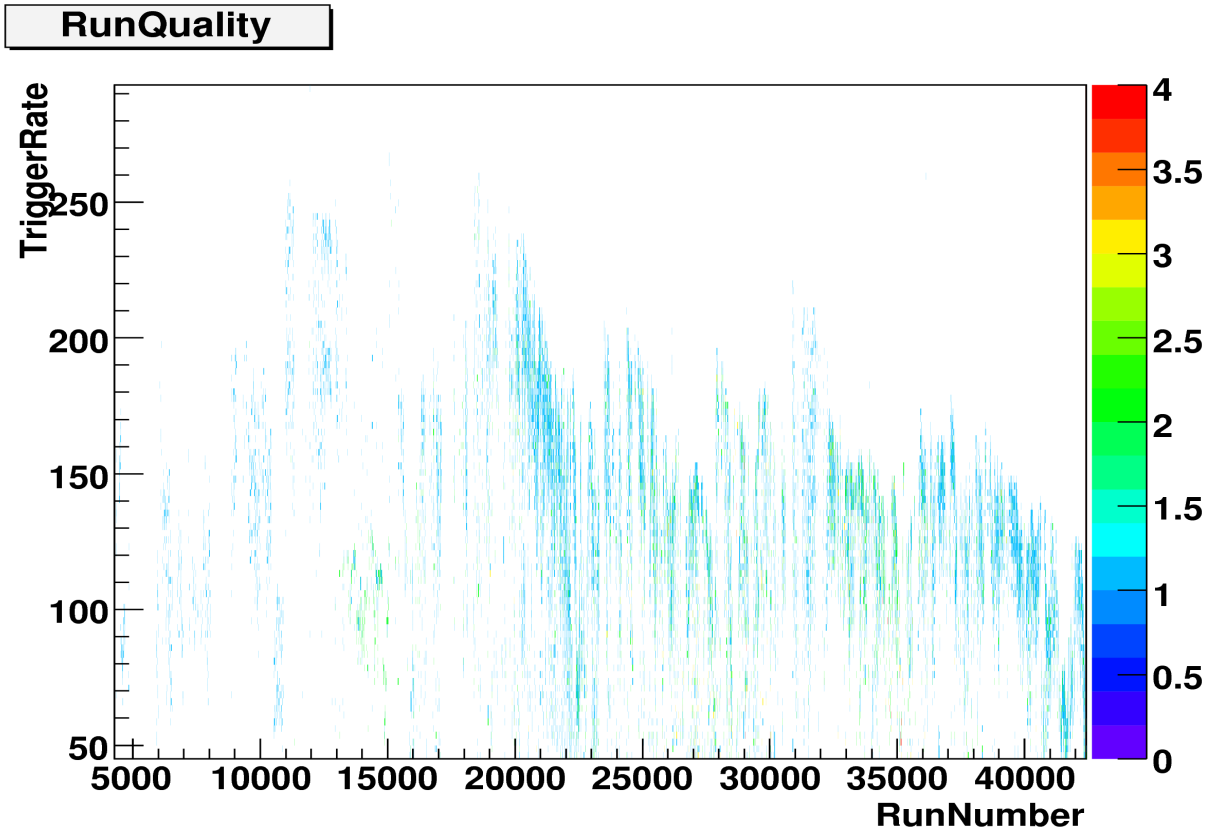
Dependency with:

- Dead time
- Zenith angle
- Time (ageing, PMT gain)

⇨ Needed to be "corrected"

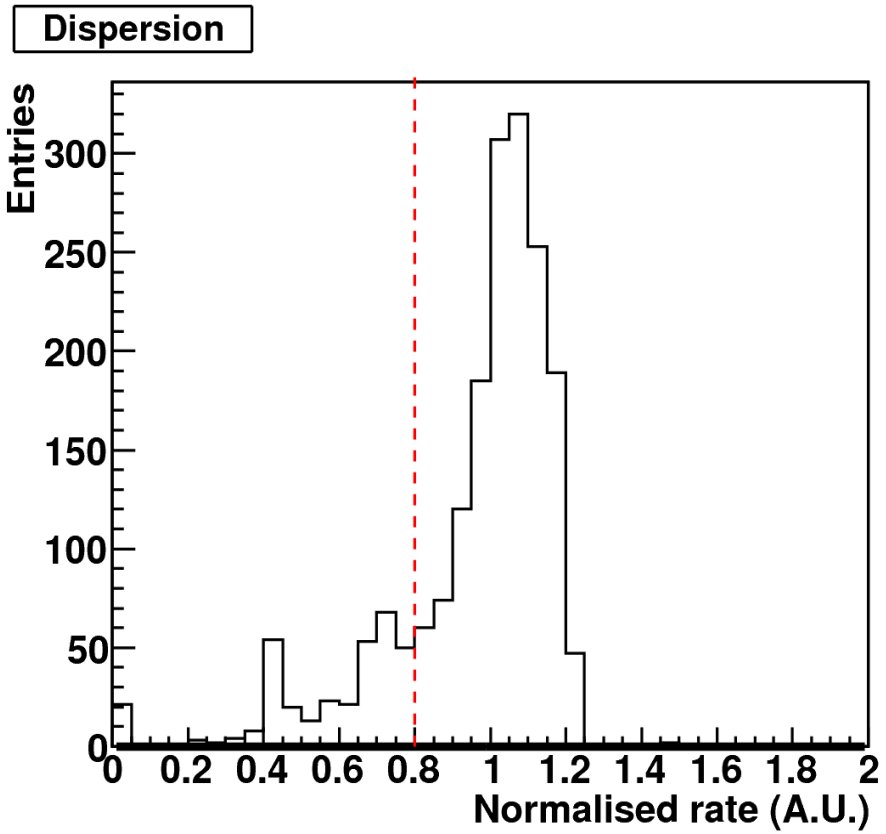
- Meteo issues
- Hardware issues (trigger, cameras, …)

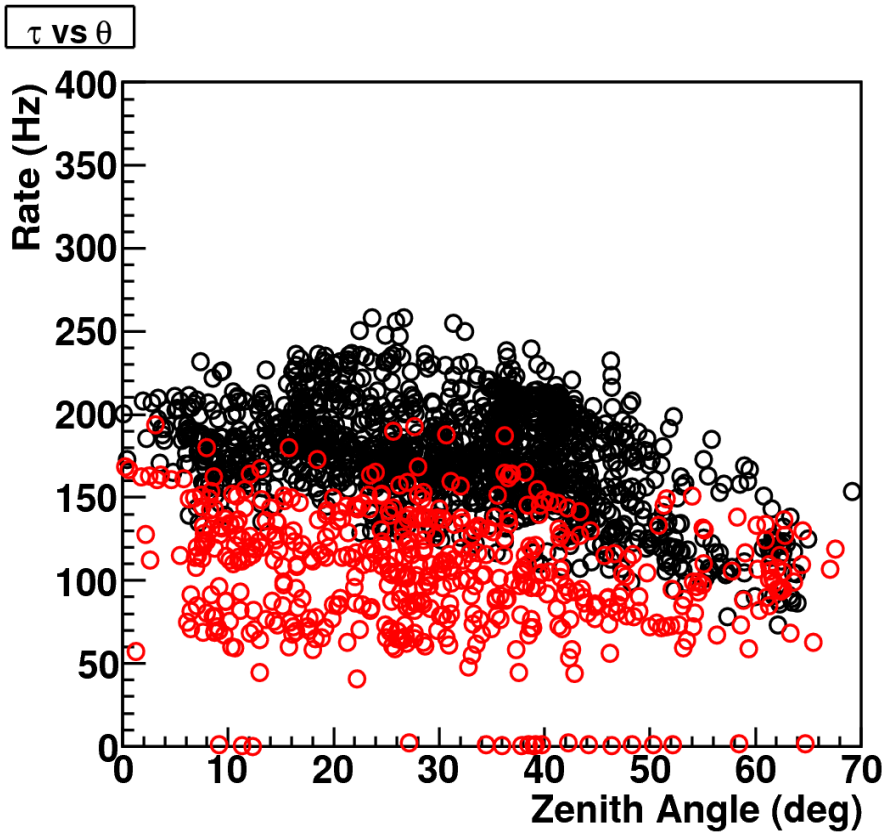
⇨ There have to be identified



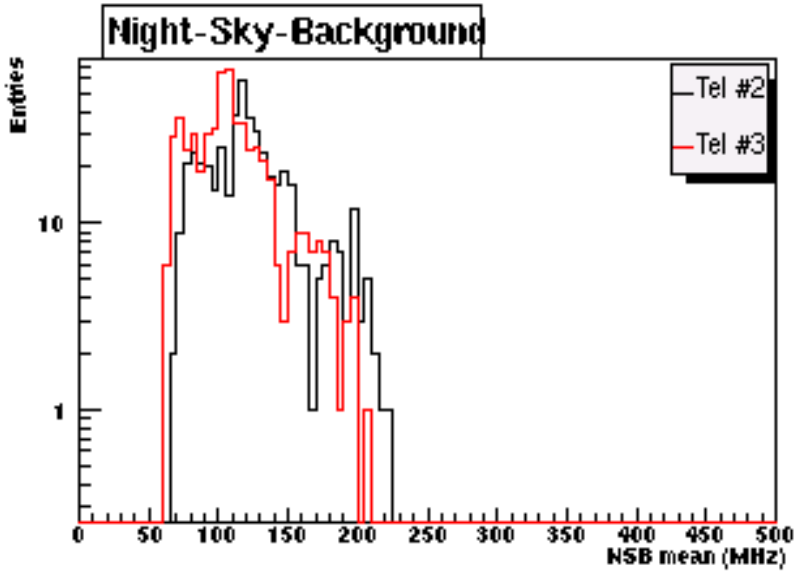
Trigger data (5)

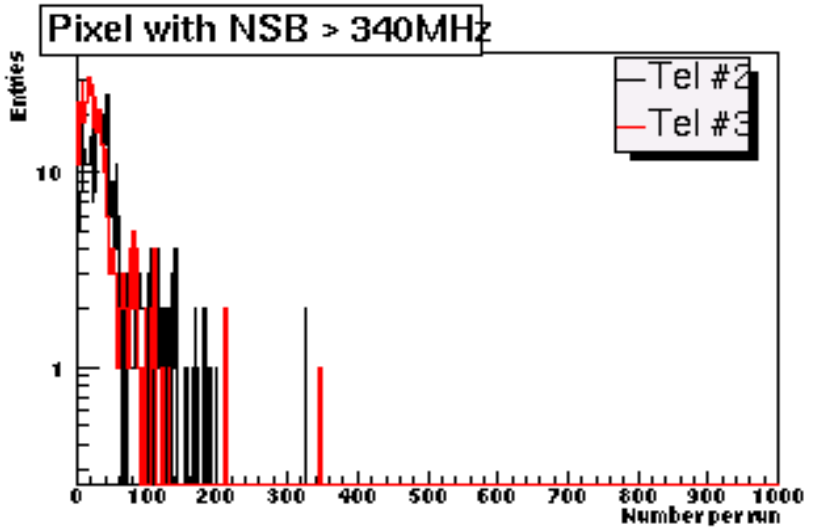
- An example of selection:

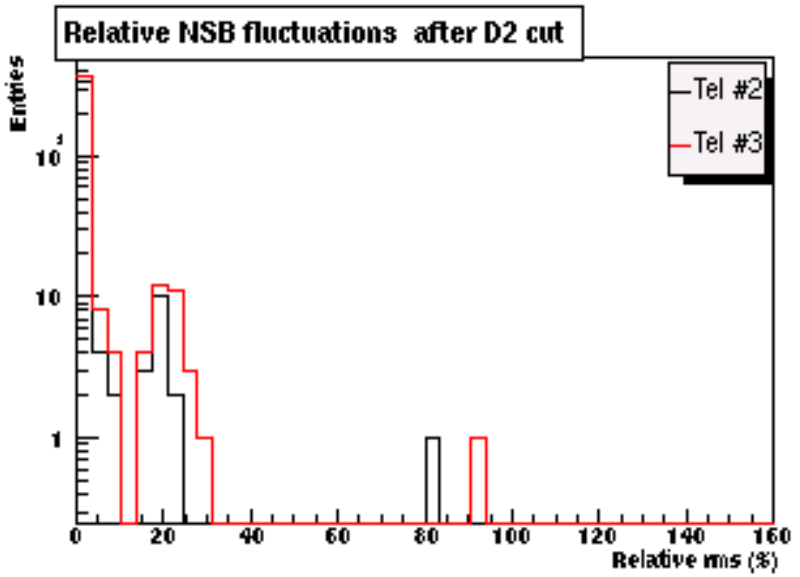




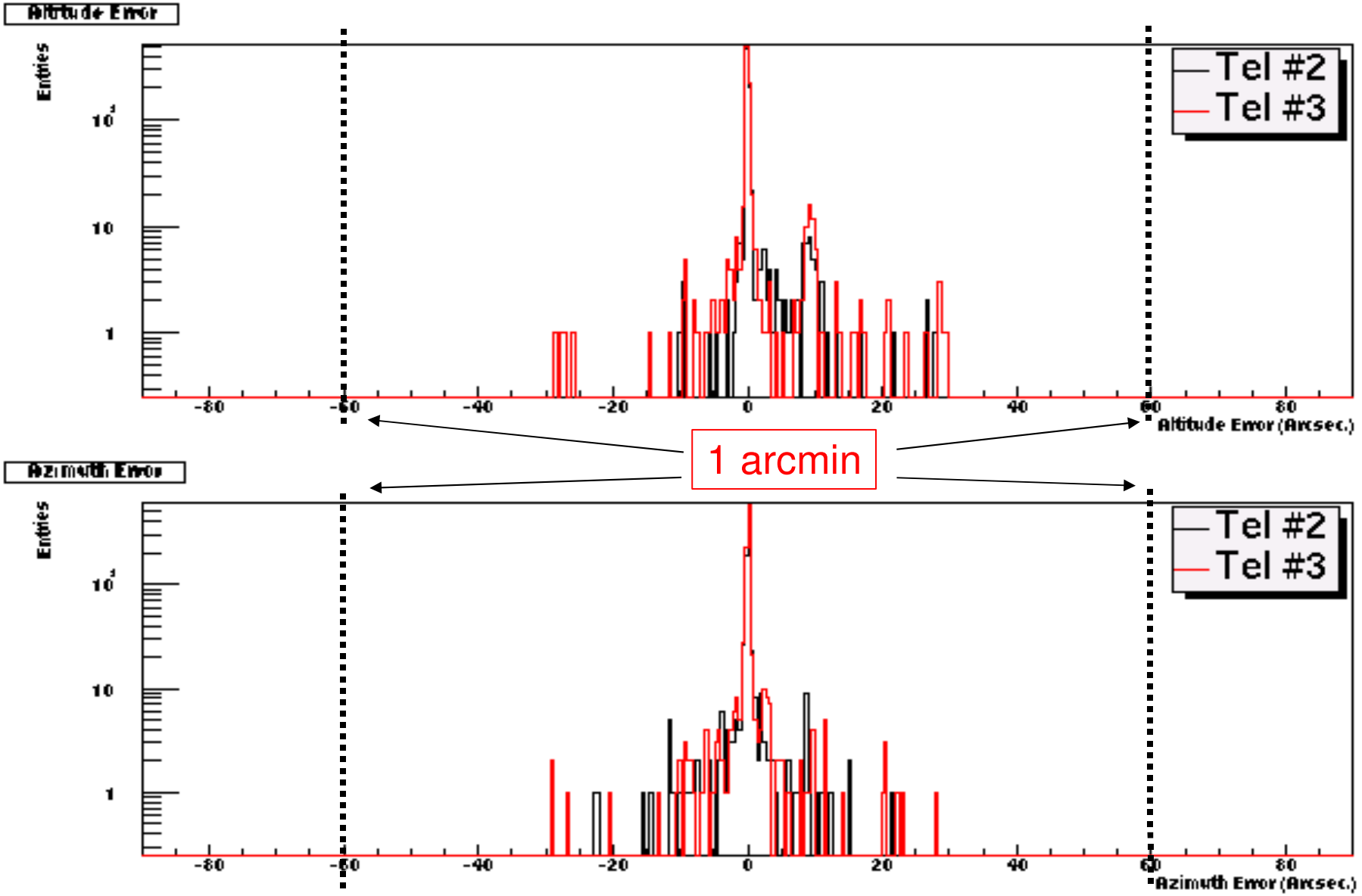
Camera-Electronics







Tracking data

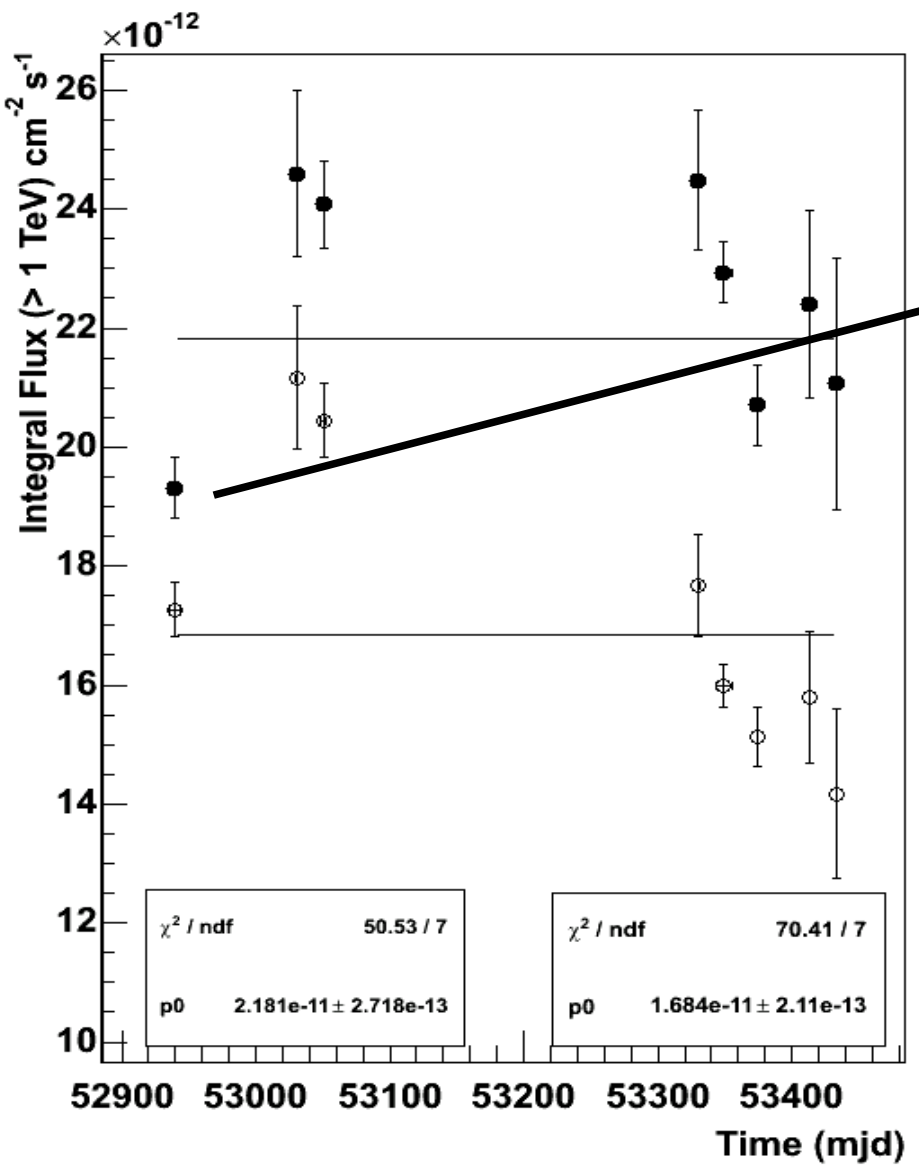


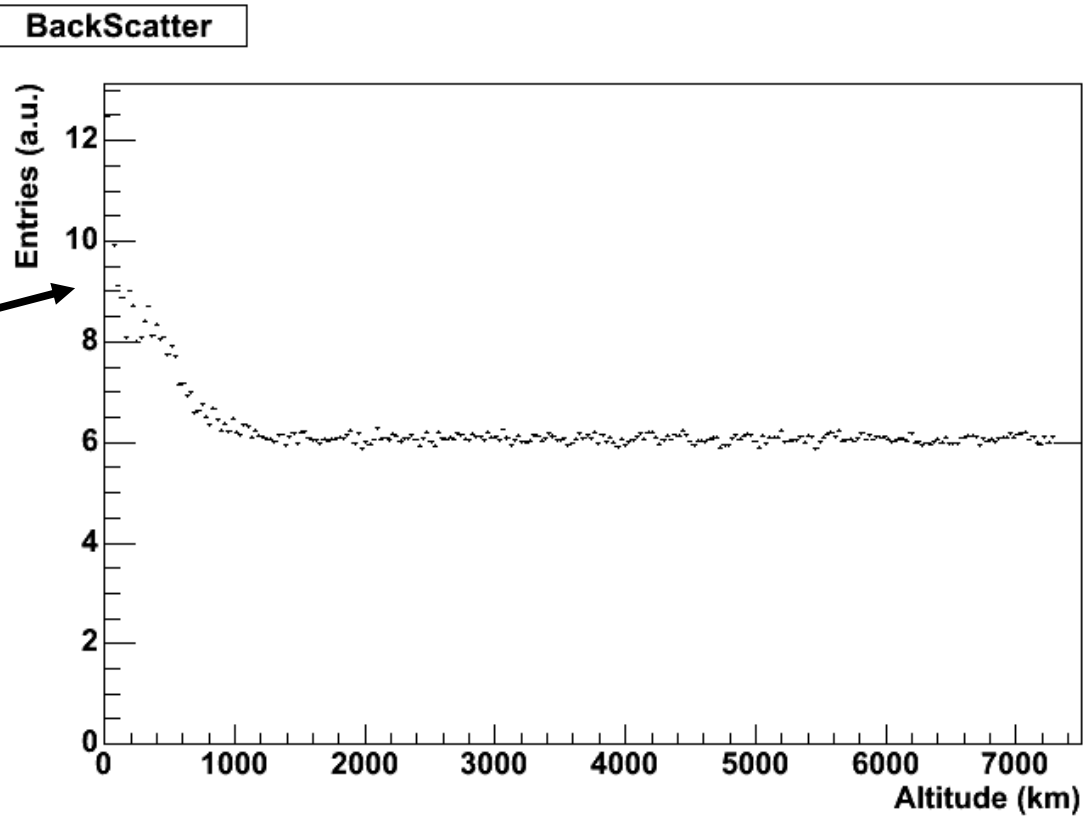
Meteo data

Use of meteo data (humidity, LIDAR, IR radiometer) is difficult

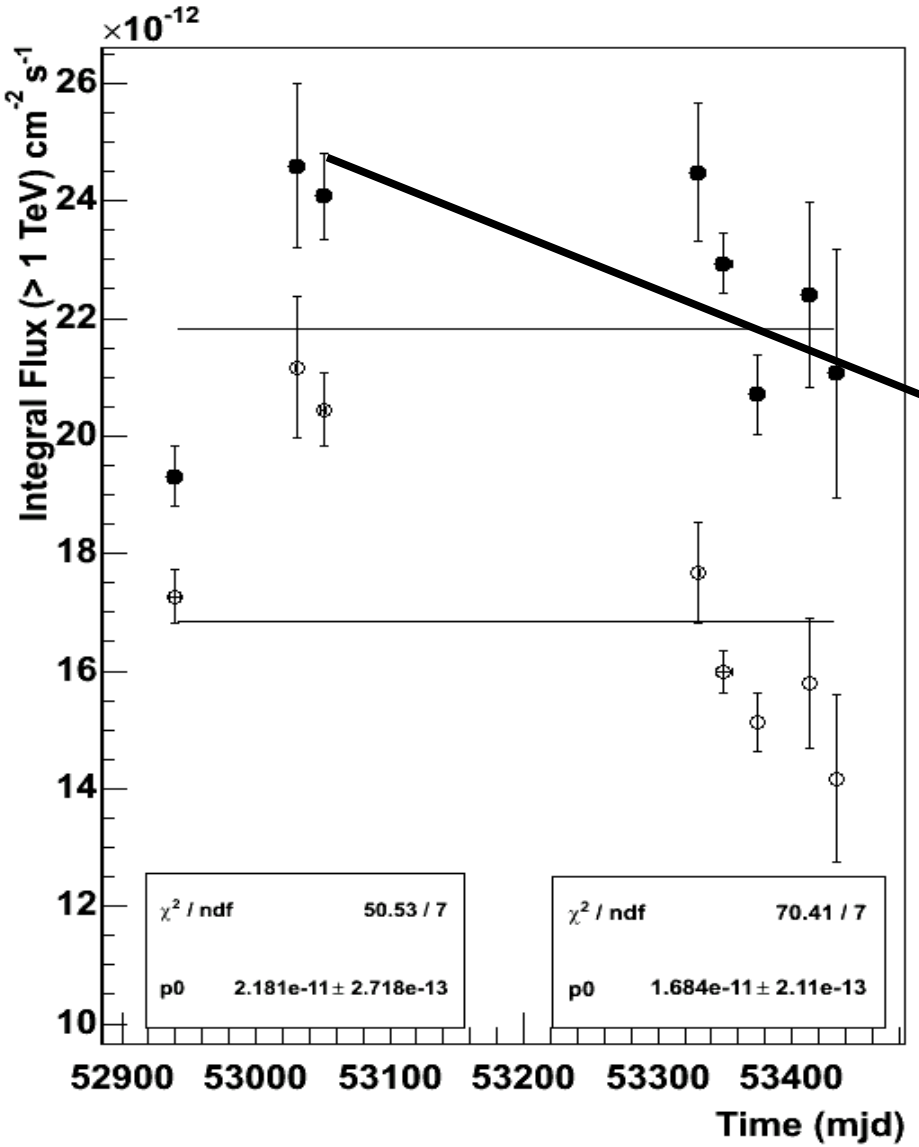
- No clear correlation between the current meteo data and the trigger rate after the ‟ bvious”c uts on the trigger stability
- No clear correlation between the current meteo data and the integral flux variations
  - Ex: Light curve of the Crab

Meteo data (2)


×10^-12
Integral Flux (> 1 TeV) cm^-2 s^-1
26
24
22
20
18
16
14
12
10
χ² / ndf 50.53 / 7
p0 2.181e-11 ± 2.718e-13
χ² / ndf 70.41 / 7
p0 1.684e-11 ± 2.11e-13
52900 53000 53100 53200 53300 53400
Time (mjd)


BackScatter
Entries (a.u.)
12
10
8
6
4
2
0
0 1000 2000 3000 4000 5000 6000 7000
Altitude (km)

Meteo data (3)


×10^-12
Integral Flux (> 1 TeV) cm^-2 s^-1
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24
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20
18
16
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52900
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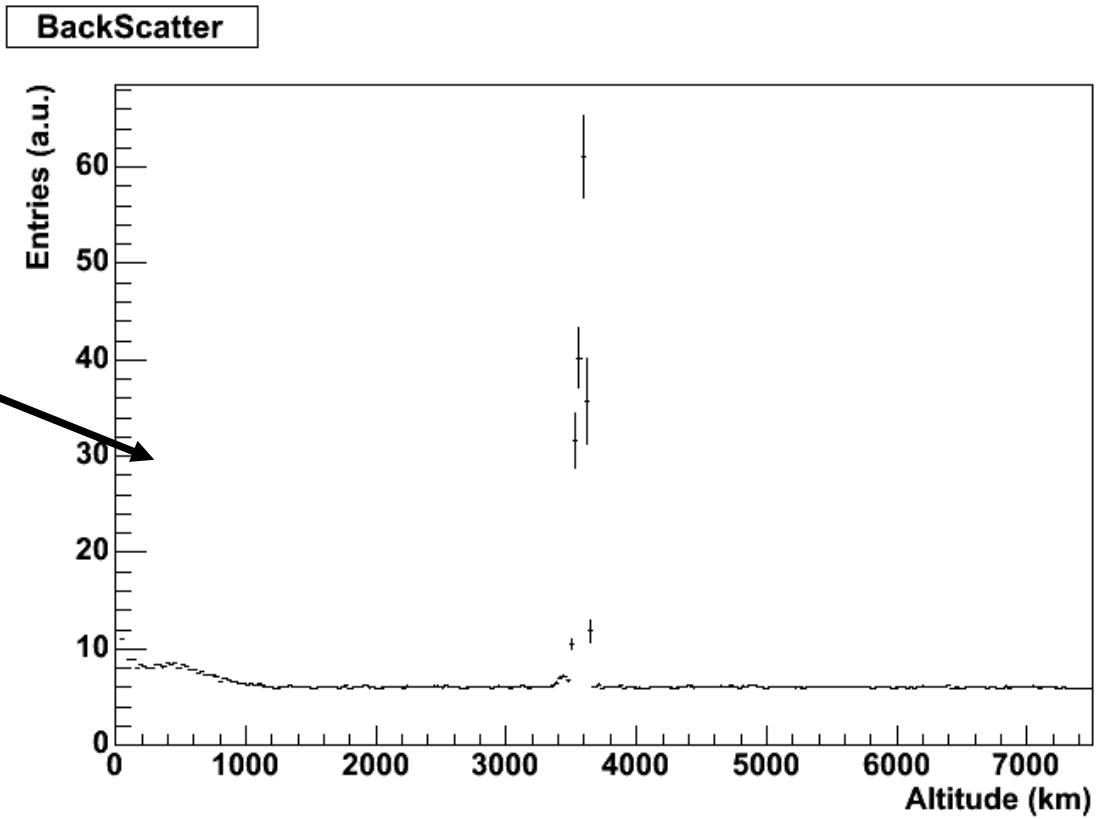
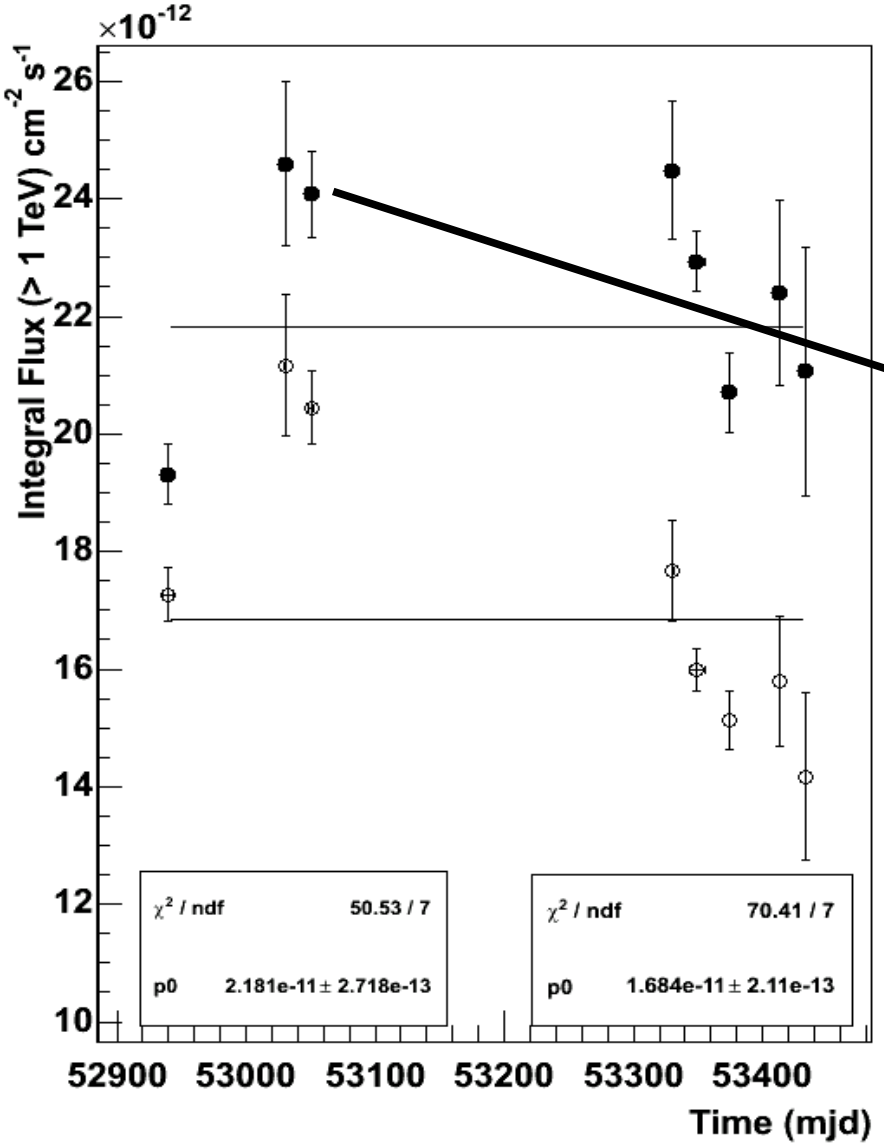

BackScatter
Entries (a.u.)
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
7000
Altitude (km)

Meteo data (3)


×10^-12
Integral Flux (> 1 TeV) cm^-2 s^-1
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52900
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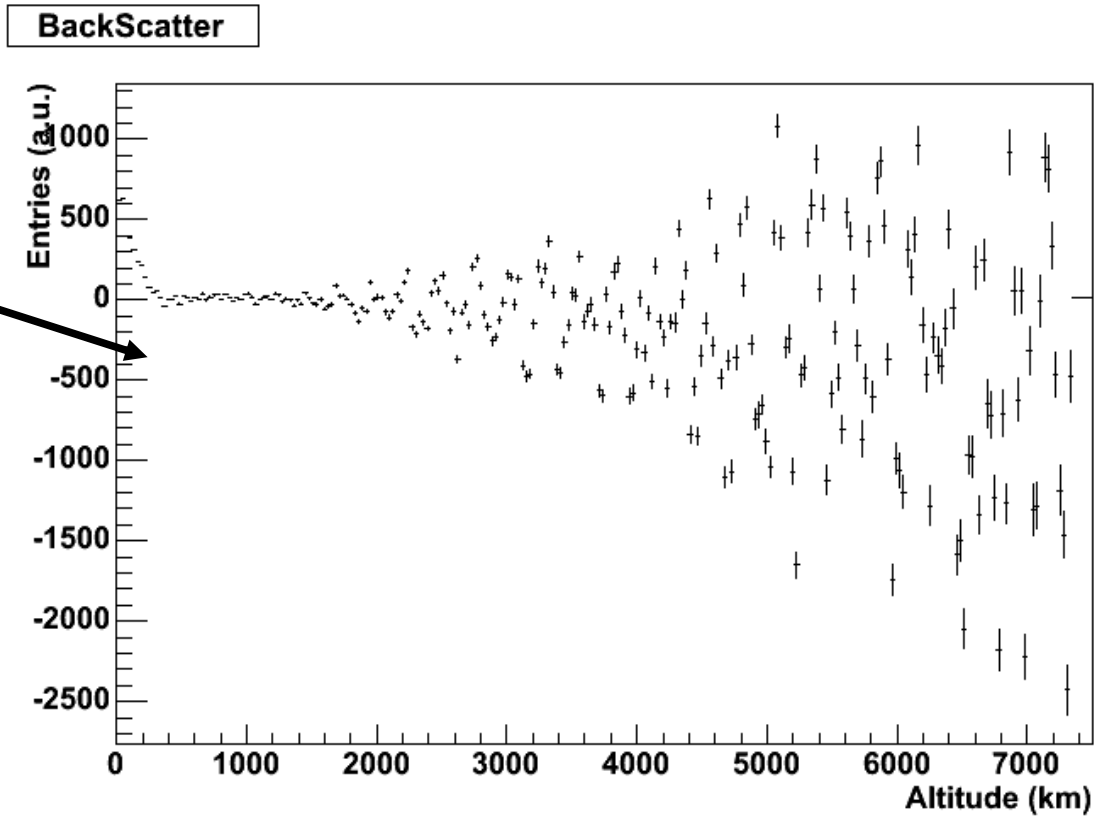
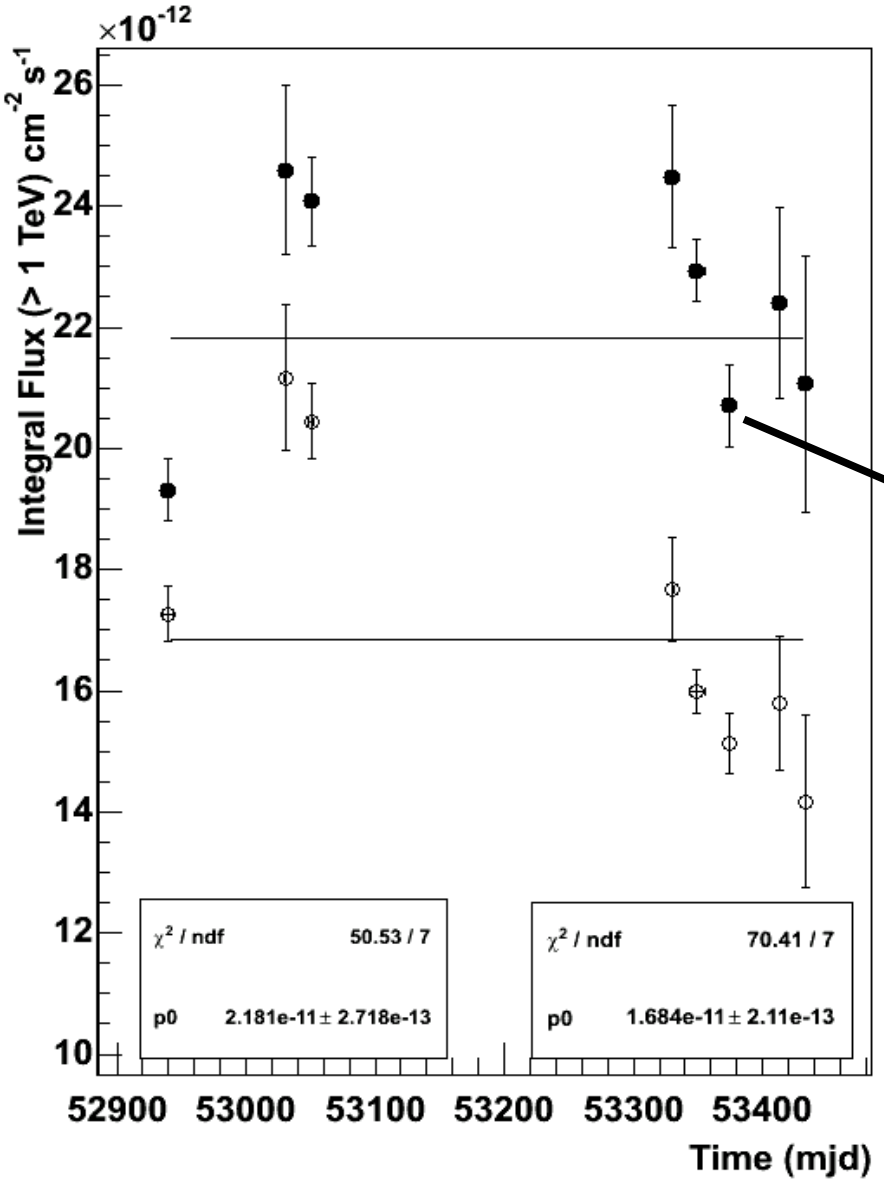

BackScatter
Entries (a.u.)
1000
500
0
-500
-1000
-1500
-2000
-2500
0
1000
2000
3000
4000
5000
6000
7000
Altitude (km)

Meteo Data (4)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χ² / ndf 50.53 / 7
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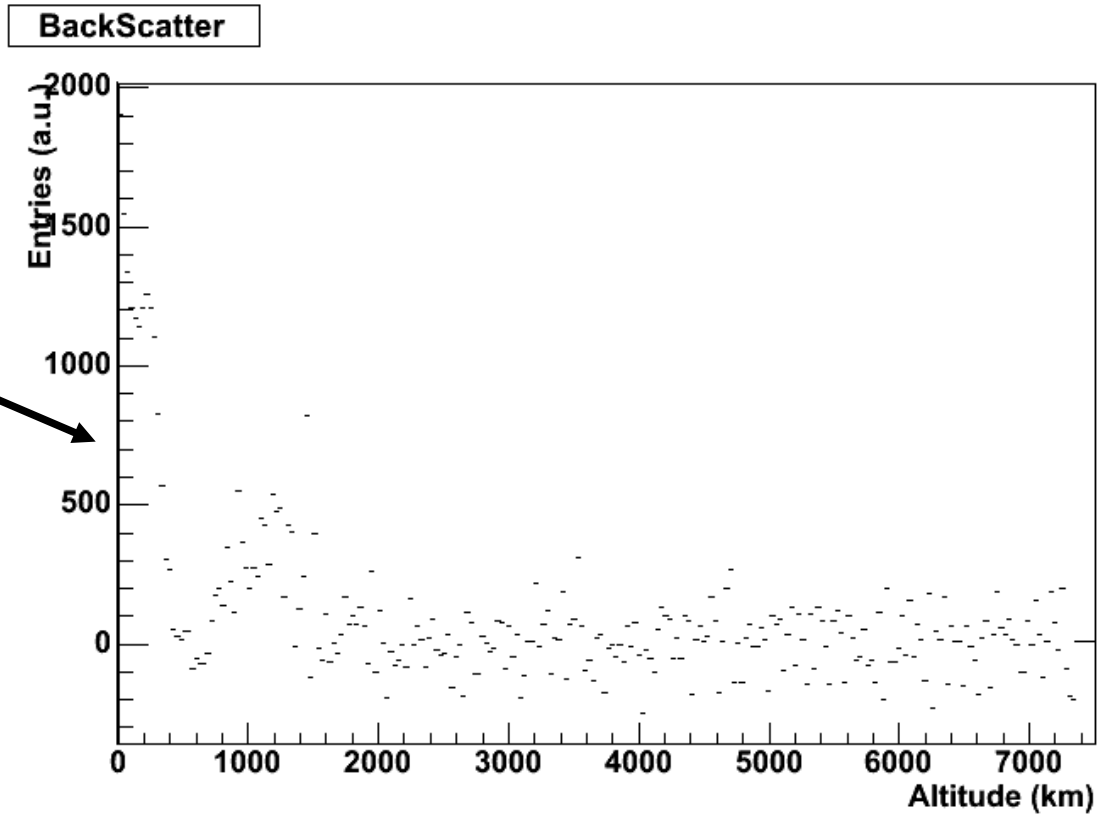
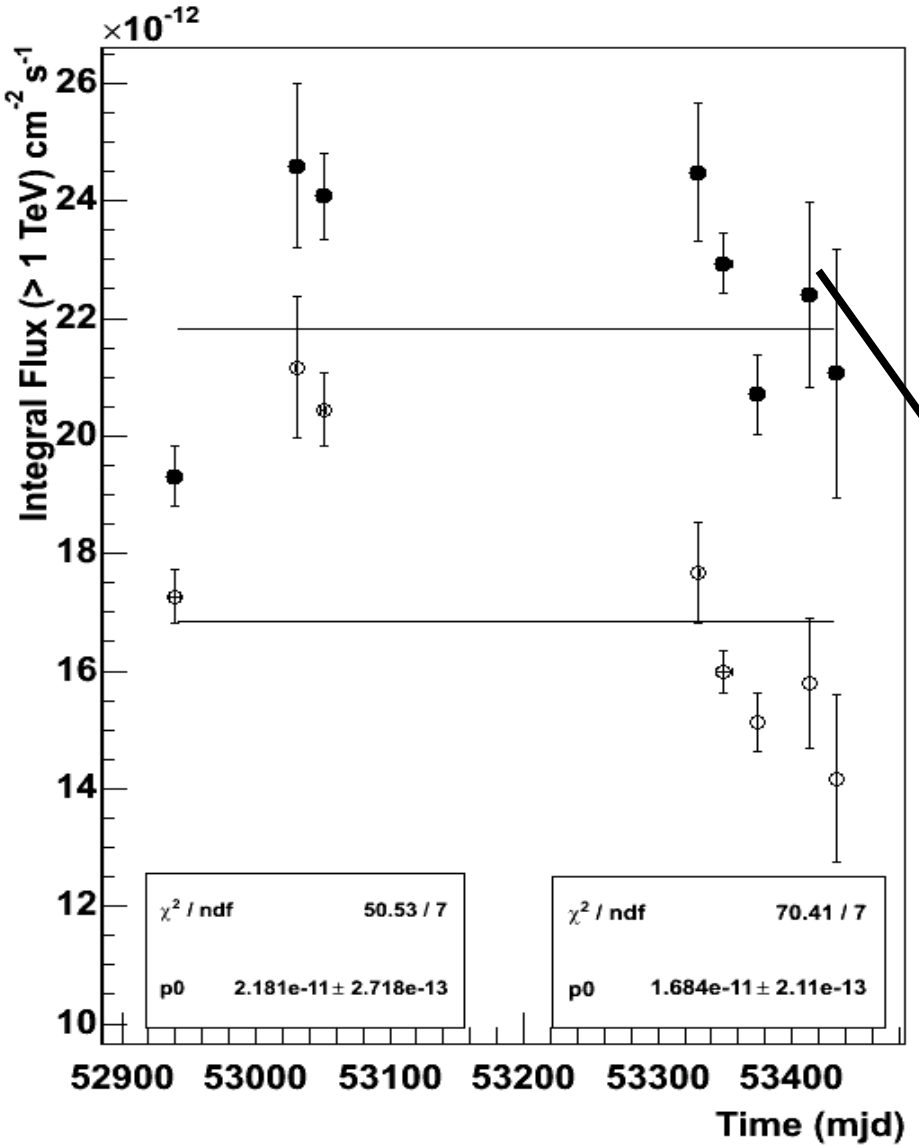
52900 53000 53100 53200 53300 53400
Time (mjd)


BackScatter
Entries (a.u.)
2000
1500
1000
500
0
0 1000 2000 3000 4000 5000 6000 7000
Altitude (km)

Meteo Data (5)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26
24
22
20
18
16
14
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10
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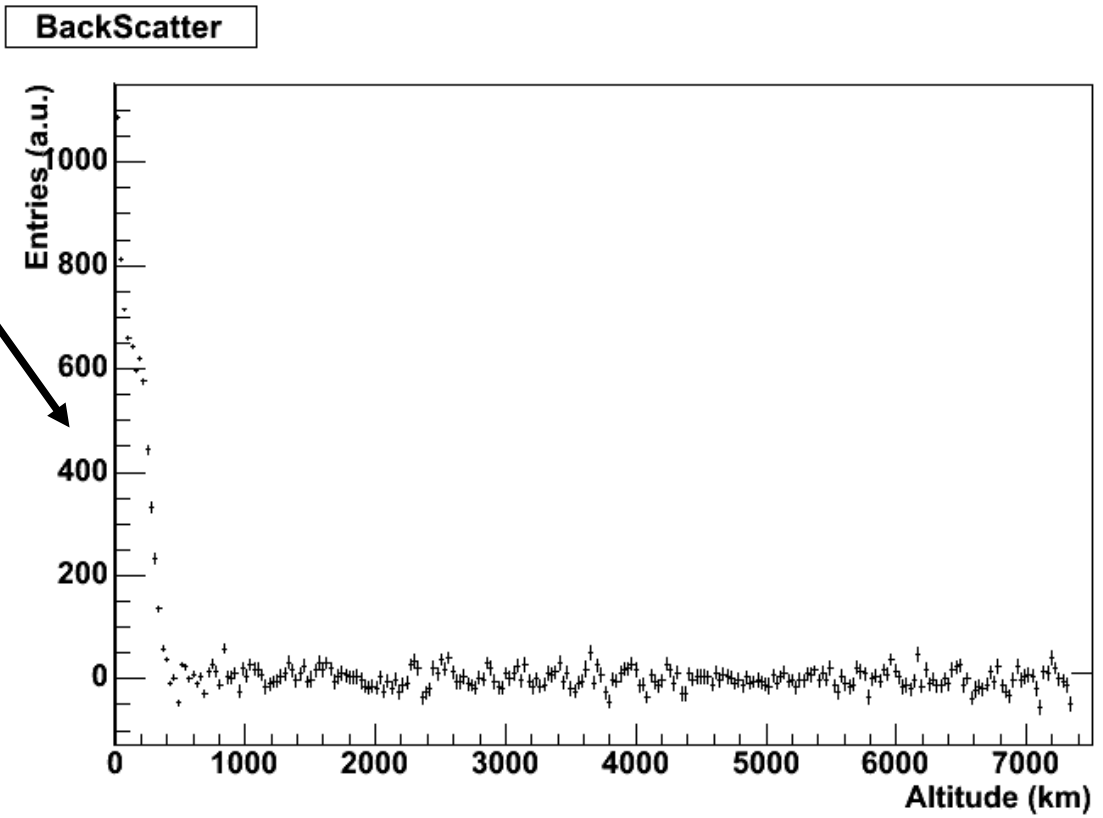
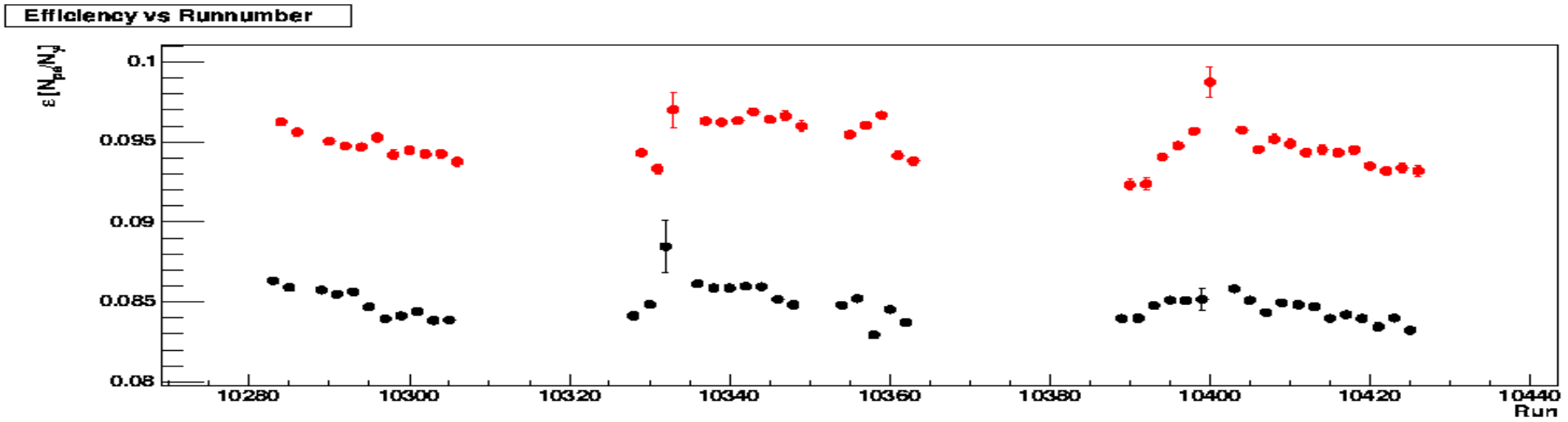
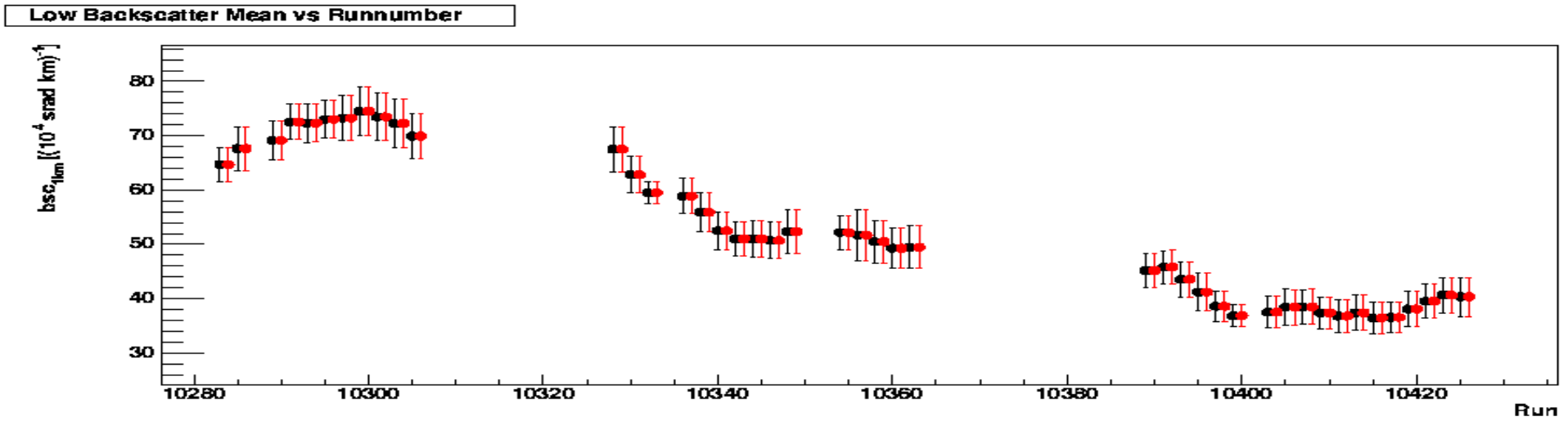
52900 53000 53100 53200 53300 53400
Time (mjd)


BackScatter
Entries (a.u.)
1000
800
600
400
200
0
0 1000 2000 3000 4000 5000 6000 7000
Altitude (km)

Meteo data (6)

- LIDAR data: backscatter vs Muon efficiency

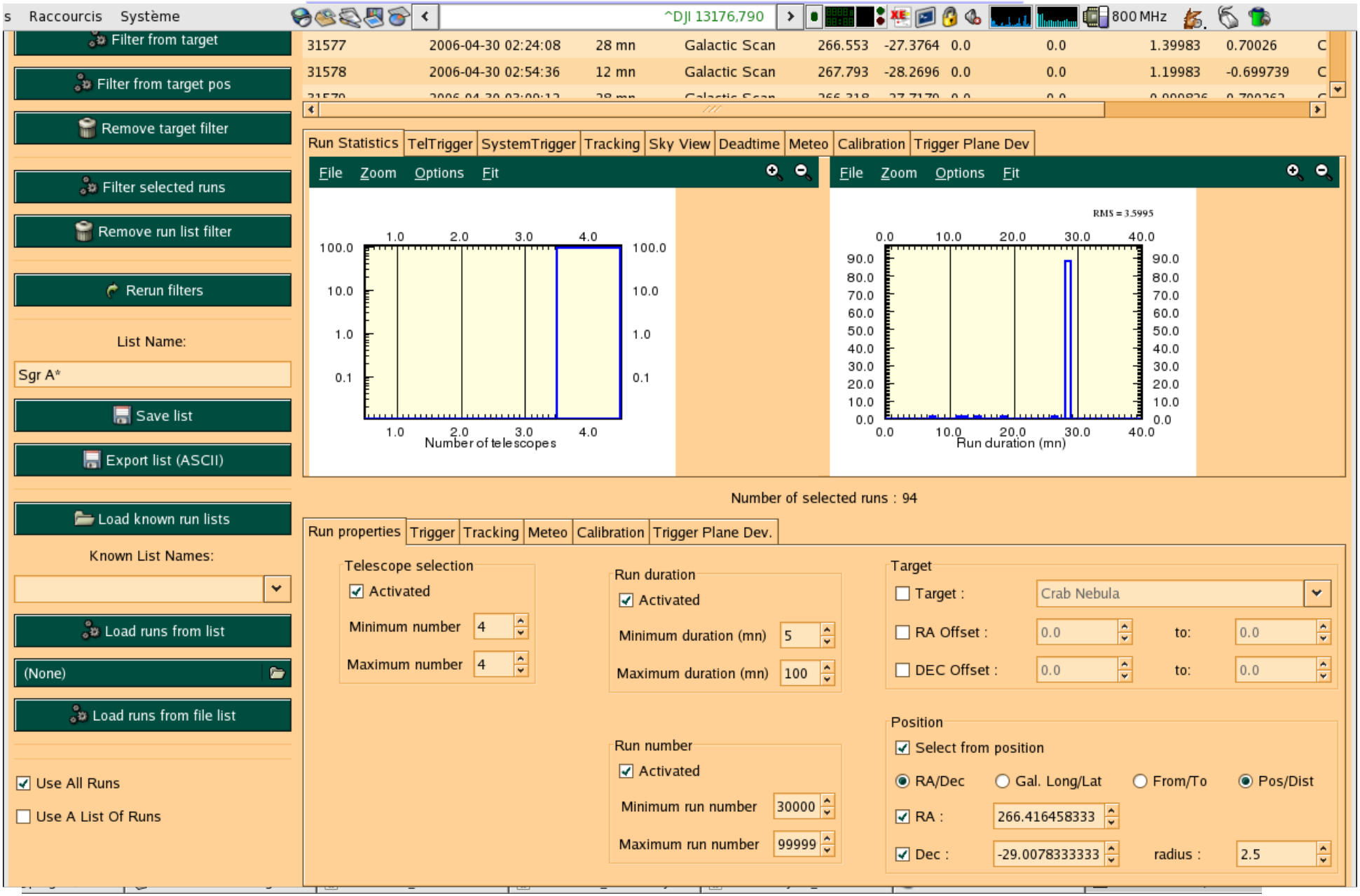




Conclusions

- Main criteria are well identified and well known
- Three (four?) methods for the run selection:
  - APC (contact: Emma De Ona-Wilhelmi)
  - Berlin ??
  - Heidelberg (contact: Karl Kosack – to check)
  - Jussieu (contact: Mathieu de Naurois)

Jussieu interface



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  - Berlin ??
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- However, the meteo informations seem to be not sufficient to reduce our systematic errors on flux measurement