



ASTRI Astrofisica con Specchi
a Tecnologia Replicante Italiana



Pre-selection of muons: image statistics

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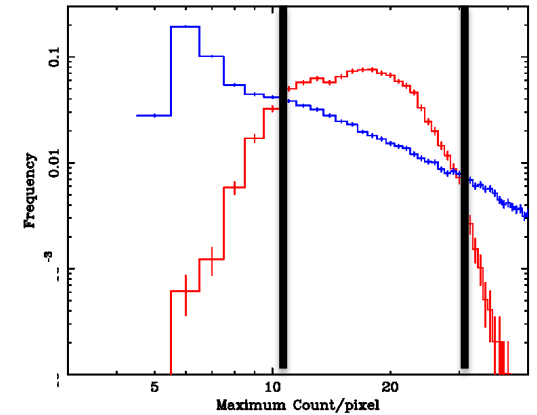


CORSIKA		Proton	Muon
	Site	Paranal	Paranal
	spectral index	2.7	2.0
	energy range	2-100 TeV	6 GeV-1 TeV
	Pointing	Zenith	Zenith
	Viewcone	4 deg	4 deg
	Max Distance	400 m	2.1 m
	Starting altitude	free	500 m above M1
	N. Event	100 000	200 000 (μ^+ , μ^-)
	Background	20×10^6 ct/s/pixel	20×10^6 ct/s/pixel
ASTRI-SIMULATOR:	includes the mirror reflectivity, the SiPM PDE, the PMMA window transmission, some of the mounting structure over the mirror		
ANALYSIS SOFTWARE	IDL code		

Steps of the Analysis

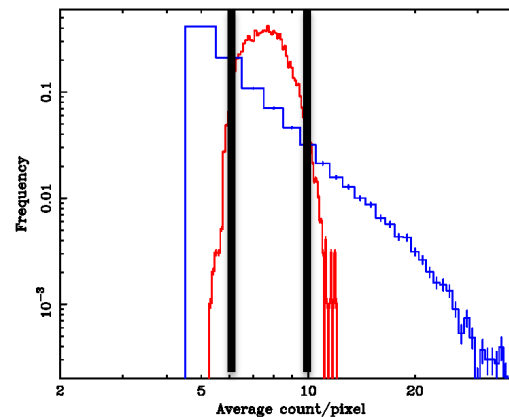
1) We produced the histograms over all analysed events of the following variable:

- the maximum count in the pixels of each image

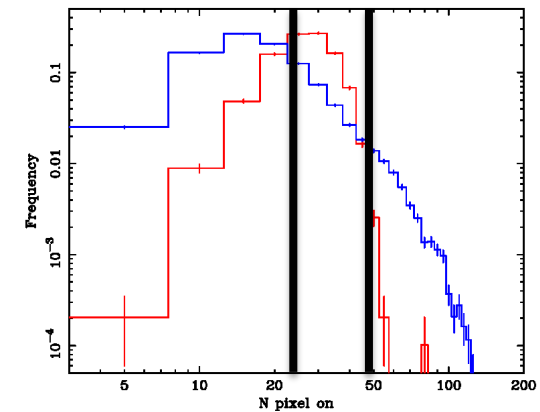


— Proton
— Muon

- the average of count left after the cuts.

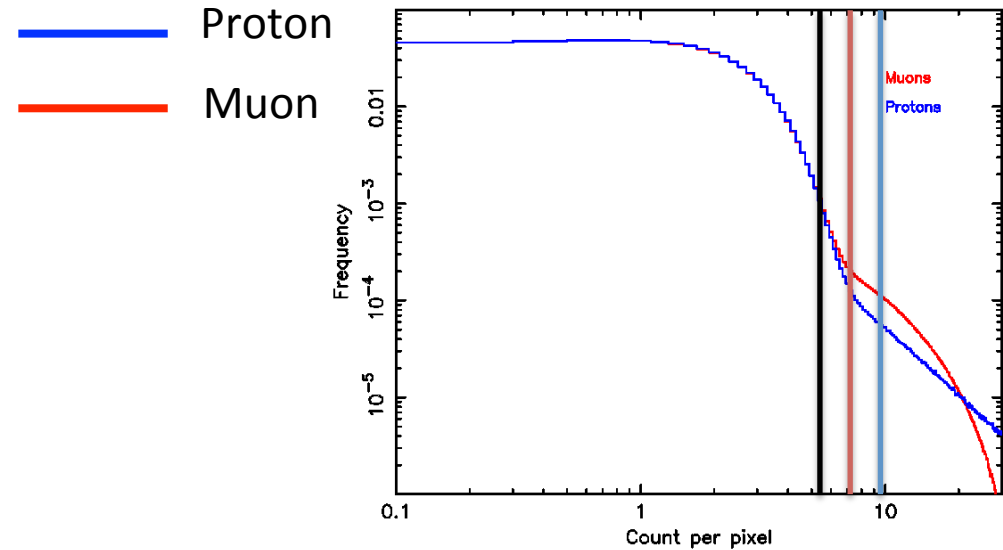


- the number of pixel left after a given cut



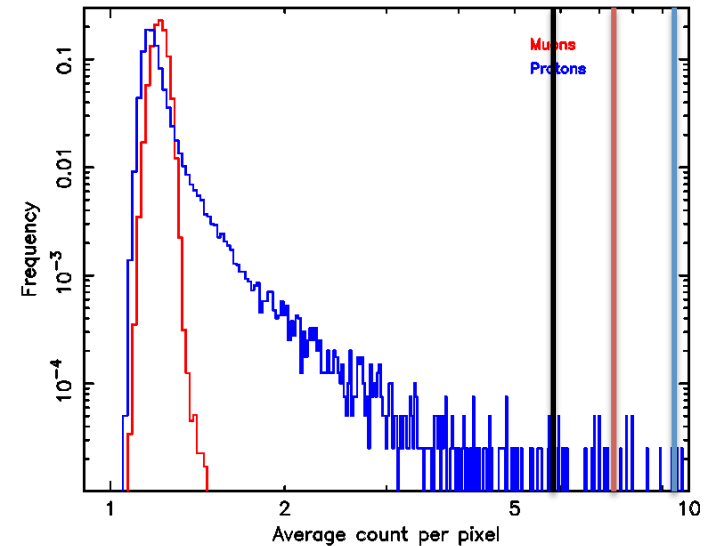
2) We computed the percentage of protons and muons contained in the interval where the muon distribution is higher than the proton one.

1) Cut with fixed number of count:
5, 7 and 10 counts



2) Cut with a number of count equal to
5xAverage, 7xAverage and 10xAverage.

This cut depends on the image statistics



Results and Conclusion

Selection on the maximum count

Proton	Muon
36%	92%

Selection on the average count after cut

Cut	Proton	Muon
5 count	32%	91%
7 count	42%	92%
10 count	37%	92%
5xAverage	37%	92%
7xAverage	39%	93%
10xAverage	31%	84%

Selection on the number of pixel after cut

Cut	Proton	Muon
5 count	33%	84%
7 count	30%	90%
10 count	35%	89%
5xAverage	30%	86%
7xAverage	31%	88%
10xAverage	27%	72%

The investigated statistical parameters are not good for the pre-selection