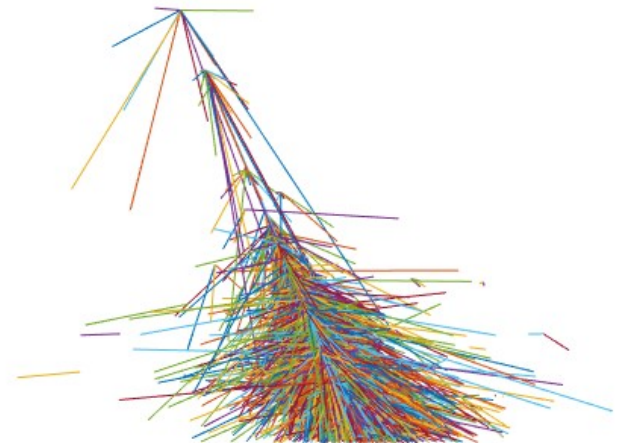


Corsika results

Amélie COHU IP2I

with A. CHEVALIER,
M. TRAMONTINI
and J. MARTEAU.



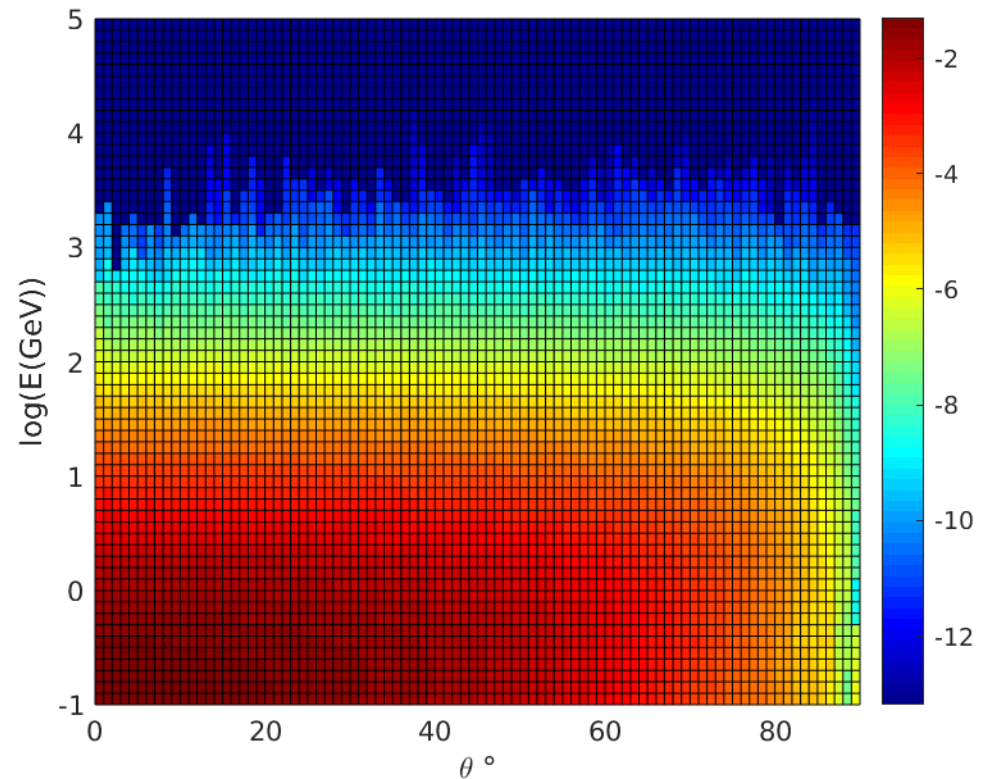
Objectives

- **Construction of muon flux matrices with energy and zenith angle dependence for a place at a certain altitude and a given date.**
- **Reconstruction of flux as a function of energy and zenith angles.**
- **Transformation of « energy dependent » matrices in matrices depending on the opacity.**
- **Study of the temperatures effects on muon flux with control of the atmosphere in CORSIKA.**

Flux Reconstruction

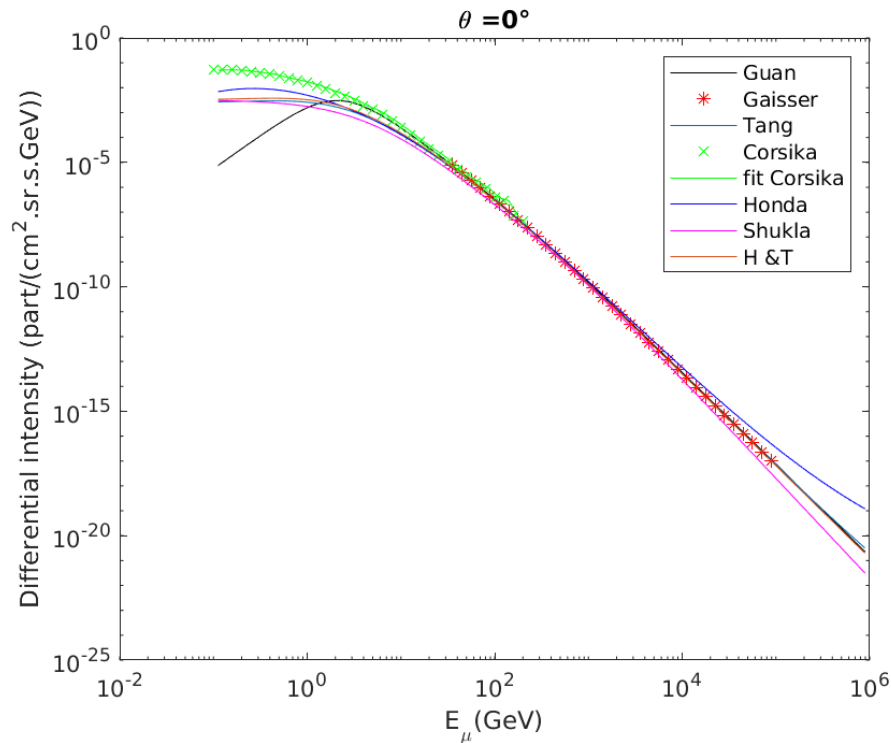
It depends on the altitude, the place (Long, Lat) and the date of the observation.

---> Muon Flux Matrix in energy and theta

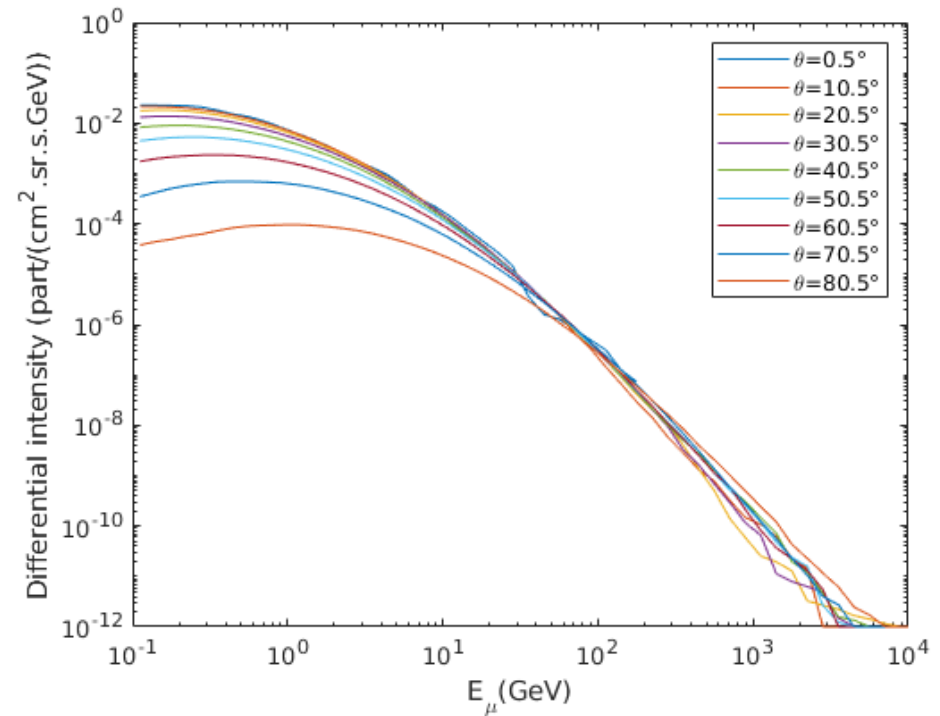


Muons flux as a function of their energy and zenith angles.

Flux Reconstruction

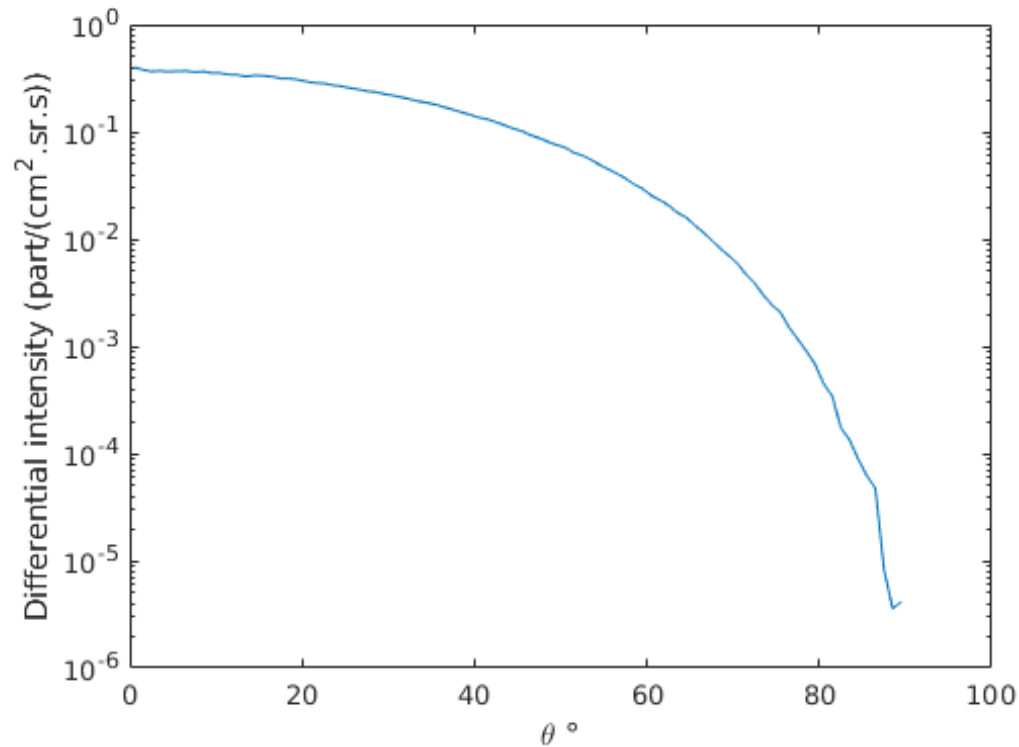


Muons flux as a function of their energy with Corsika and analytical model.



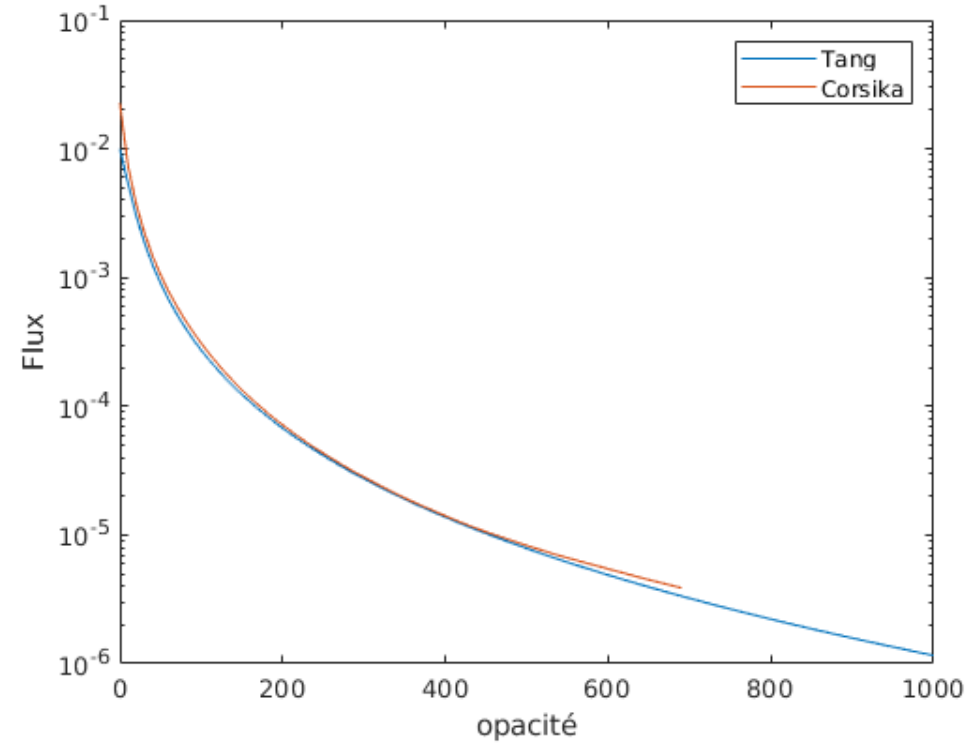
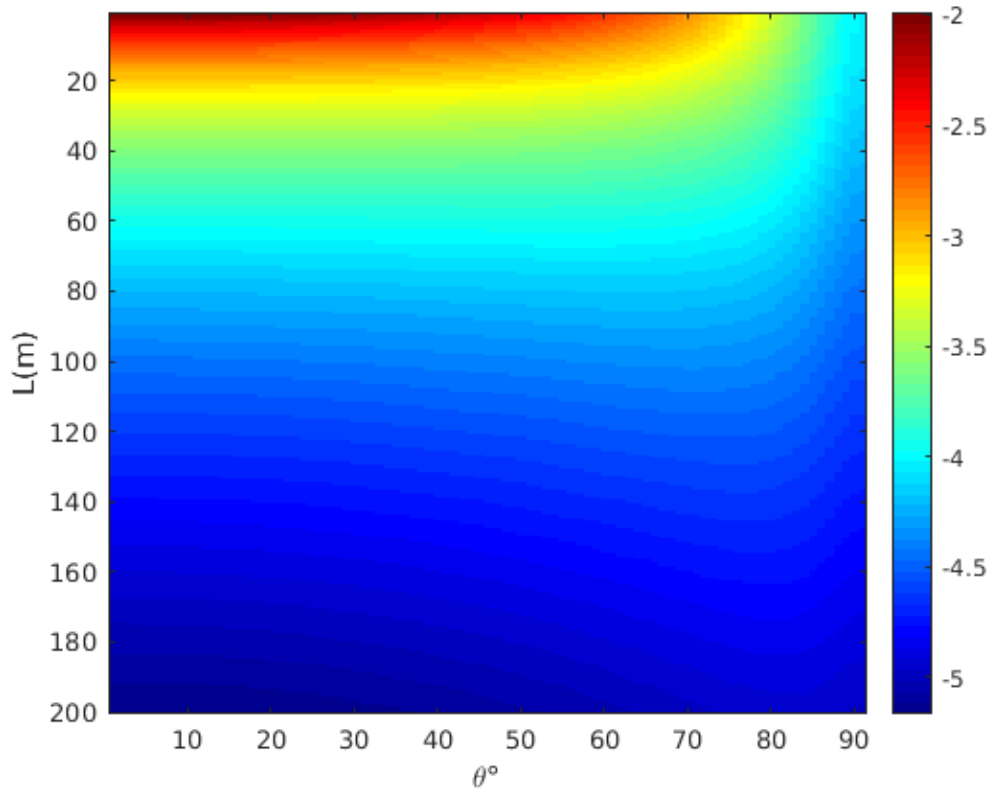
Muons flux for different zenith angles as a function of their energy.

Flux Reconstruction



Muons flux as a function of their zenith angle.

Flux and opacity

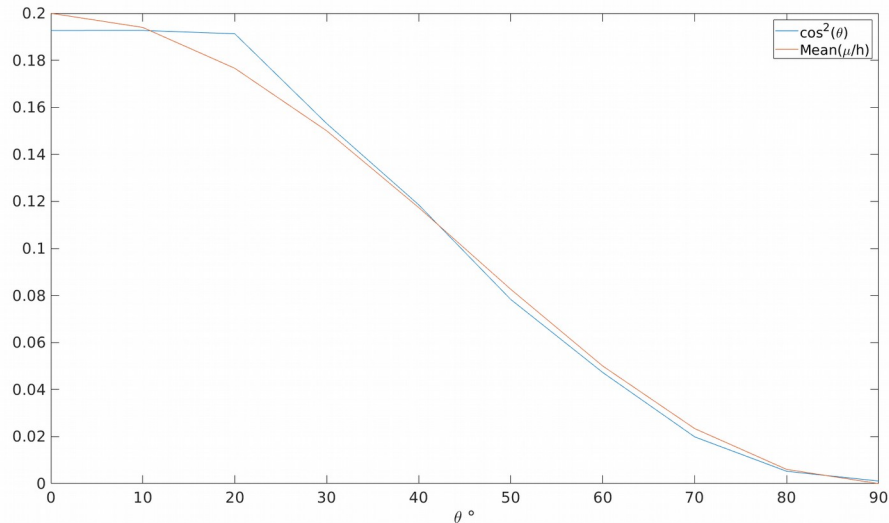


Muons flux as a function of length of the rock crossed and zenith angle.

Muons flux as a function of opacity.

Density = 2.65 g/cm³

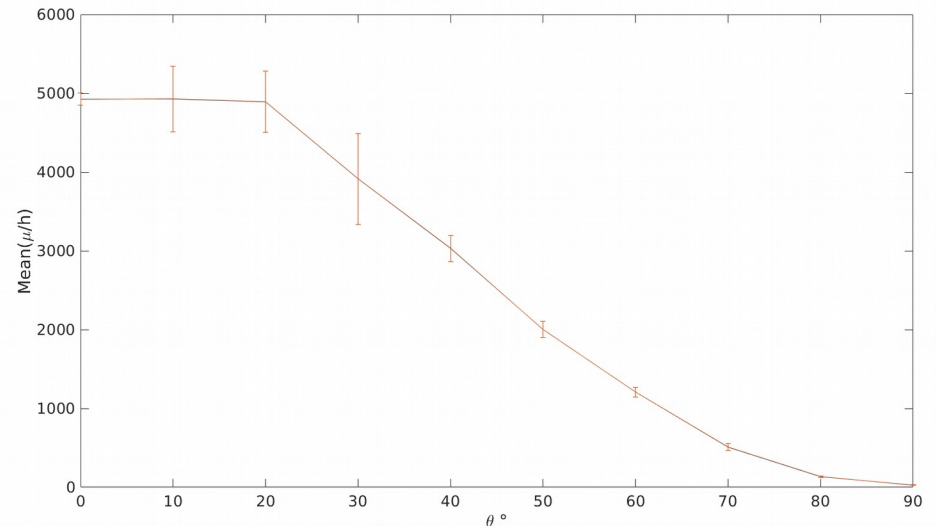
Comparison with real data



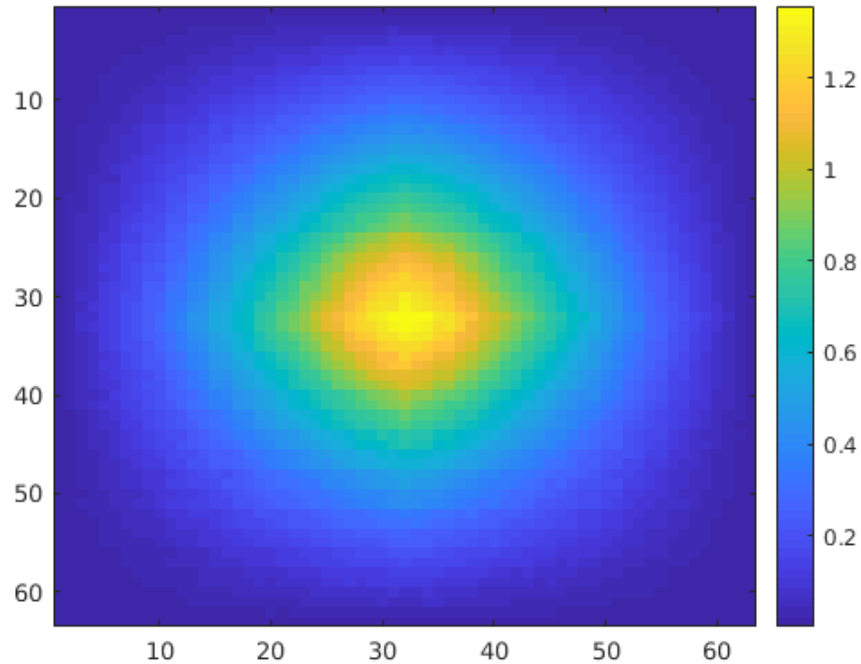
Normalized number of muons for different telescope inclinations as a function of zenithal angle + $\cos^2(\Theta)$.

Number of muons for different telescope inclinations as a function of zenithal angle + error bars.

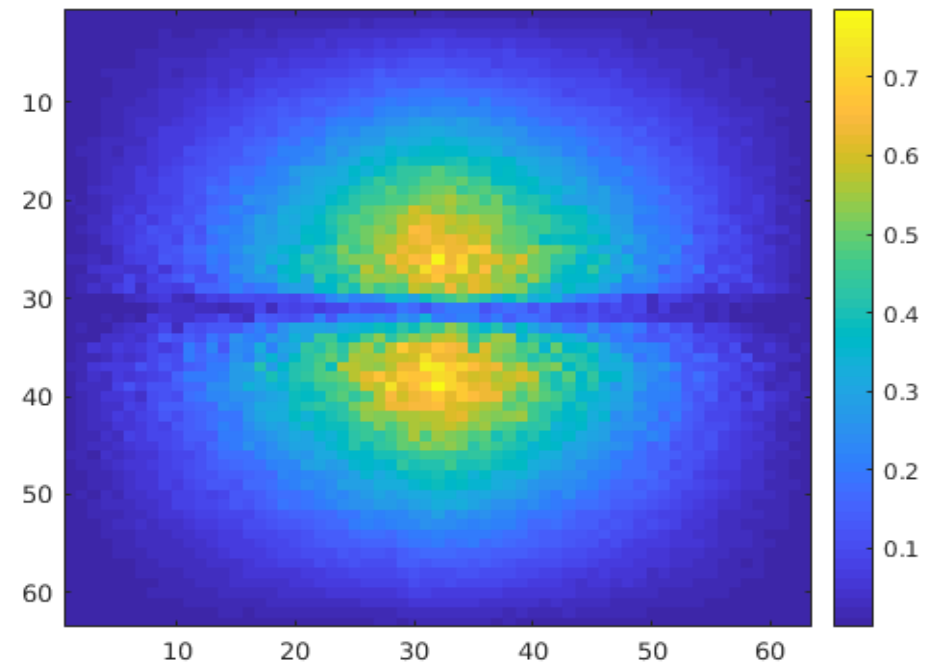
$$\text{Flux} \sim \cos^2(\Theta)$$



Comparison with real data

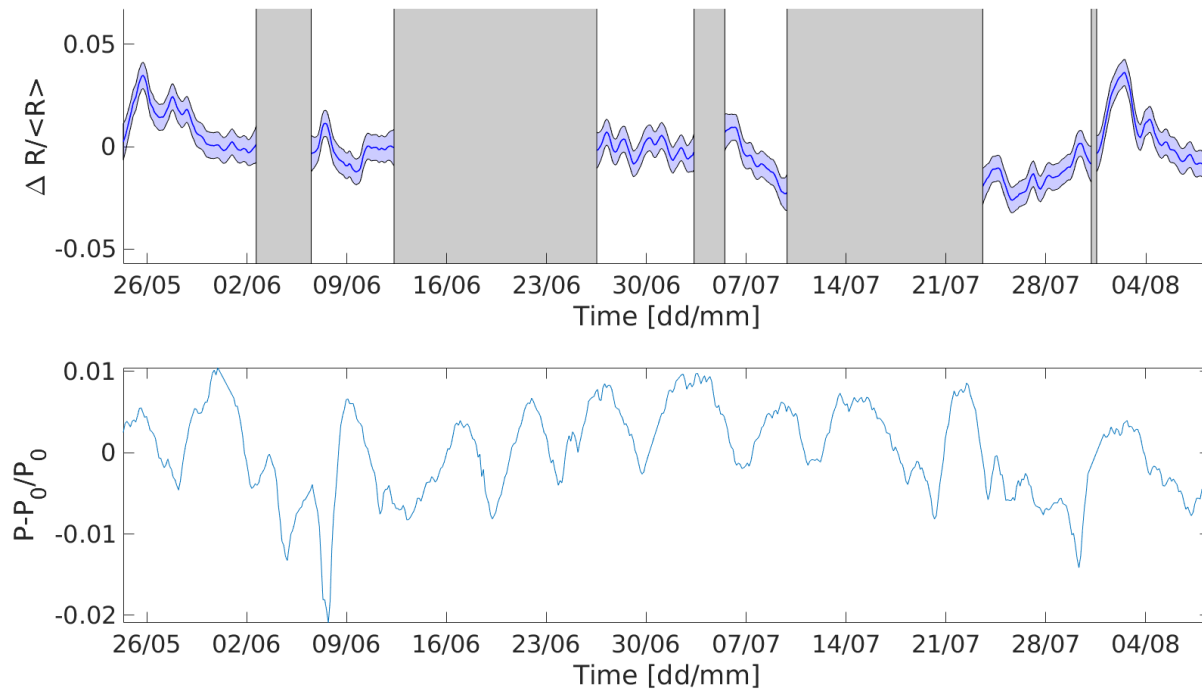


Average acceptance of the telescope (all inclinations included).



Acceptance of the telescope tilted 90° .

Environmental parameters



Relative muon flux and pressure as function of time.

→ No correlation.
Temperature effective ?
(In progress)

Conclusions & Next Steps

- **Good correlation between « Corsika » flux and analytical models.**
- **Available results in the form of "matrix" incremented in energy and zenith angle.**
- **Comparison with real data (acceptance, flux $\sim \cos^2(\theta)$...) .**
- **Study of the effects of environmental parameters on muon flux (especially with CORSIKA atmosphere).**