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Geoscientific Instrumentation Methods and Data Systems
Discussions

Interactive comment on "Air shower simulation for background estimation in muon tomography of volcanoes" *by* S. Béné

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Answer to questions :

Introduction, line 25 "Do we plan to include the other types of charged particles in the simulation, since they can also contribute to background ?" Yes, in fact they are already included in the GEANT4 simulation. They are not mentionned here because the comparison with CORSIKA was only made with respect to the muonic components of the showers (because we had only the muons in the CORSIKA data).

Figure 1 "The number of muons is not in agreement with those from the Stanev book" Indeed, the label of the vertical axis does not corresponds to what is plotted. This plot was normalized to the numer of muons, not the number of showers (which explains why

the integral of the lines gives 1). See attached the good plot, representing the average number of muons per showers, with a better agreement with what can be found in the Stanev book (energy cut = 1GeV)

Section 4, line 15 Yes, a power law with a correct spectral index is what is meant by realistic.

Section 4, line 19 "Why not restrict ourselves to proton primary for the CORSIKA data ?" This is indeed not said in the paper. We of course only considered events corresponding to proton primaries in our CORSIKA data. This has to be added in the text.

Furthermore, i agree to all comments, and modifications will be made accordingly.

in particular, p.568 l.4, "inclusive cosmic ray flux" not only refers to the various nuclear species but also to the varying energy and incident angle so :

"of an inclusive cosmic ray flux" → "of a cosmic ray flux which includes all the nuclear species, covering a wide energy range and the full sky aperture"

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 563, 2012.

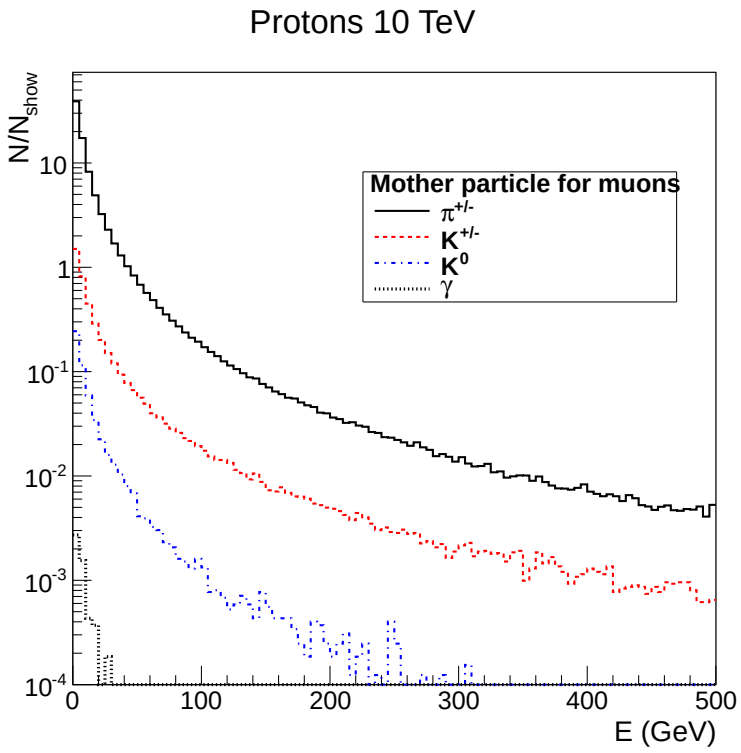
Protons 10 TeV
N/N_show
10
1
10^-1
10^-2
10^-3
10^-4
0
100
200
300
400
500
E (GeV)
Mother particle for muons
π+/-
K+/-
K0
γ

Fig. 1.