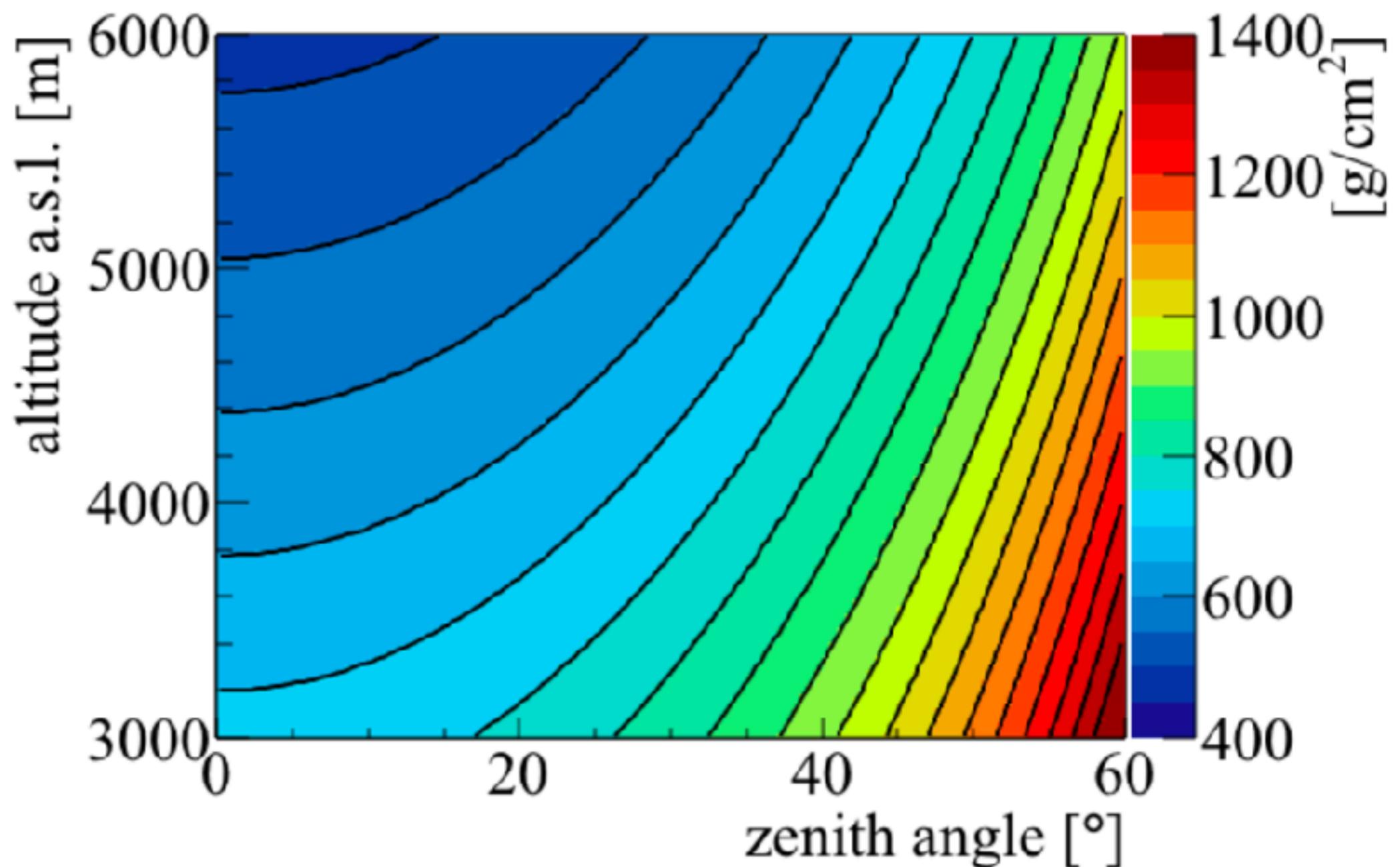


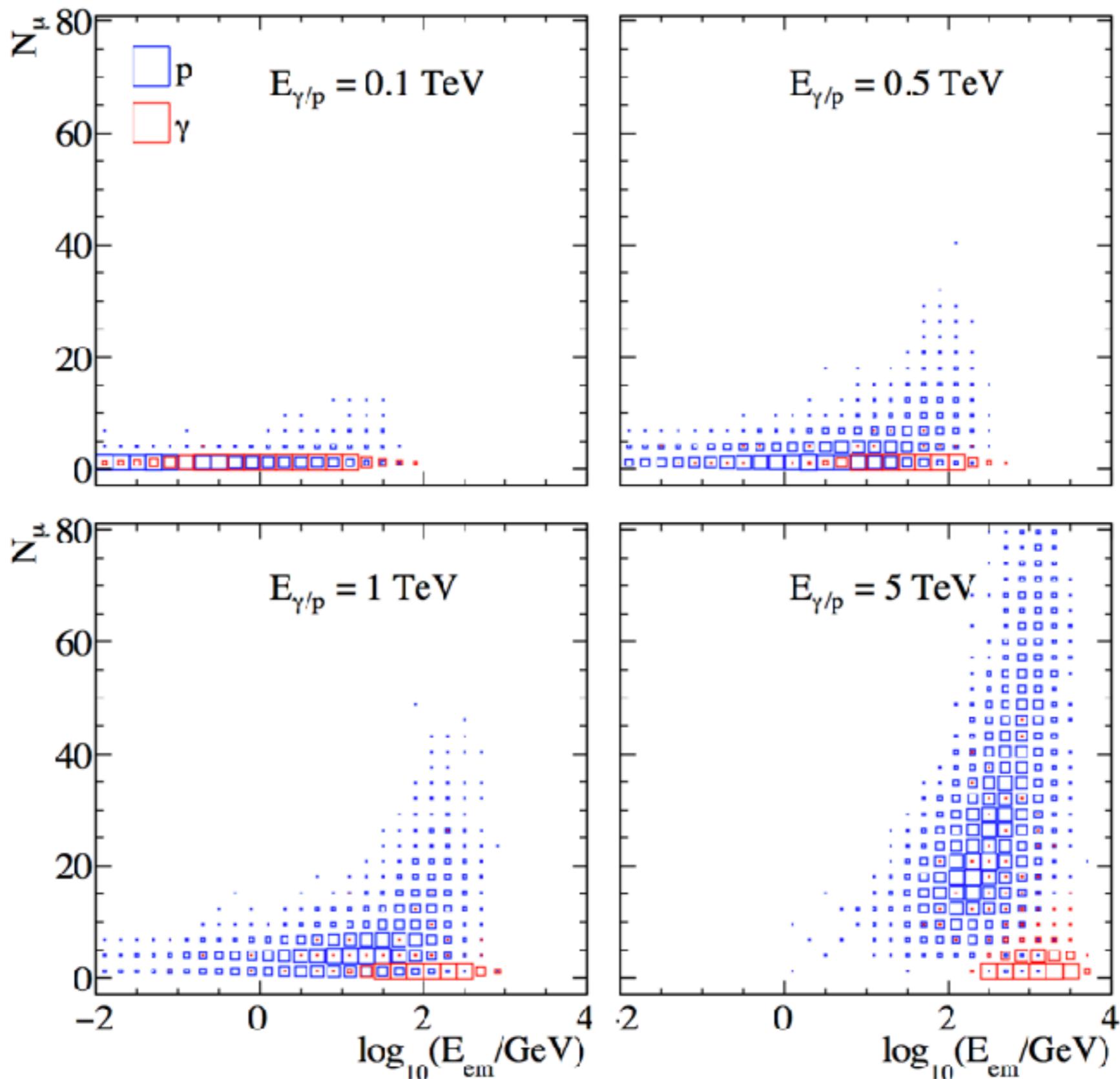
*Baseline Design for a Next Generation Wide-Field-of-View  
Very-High-Energy Gamma-Ray Observatory*

*Harm Schoorlemmer, Rubén López-Coto, Jim Hinton*

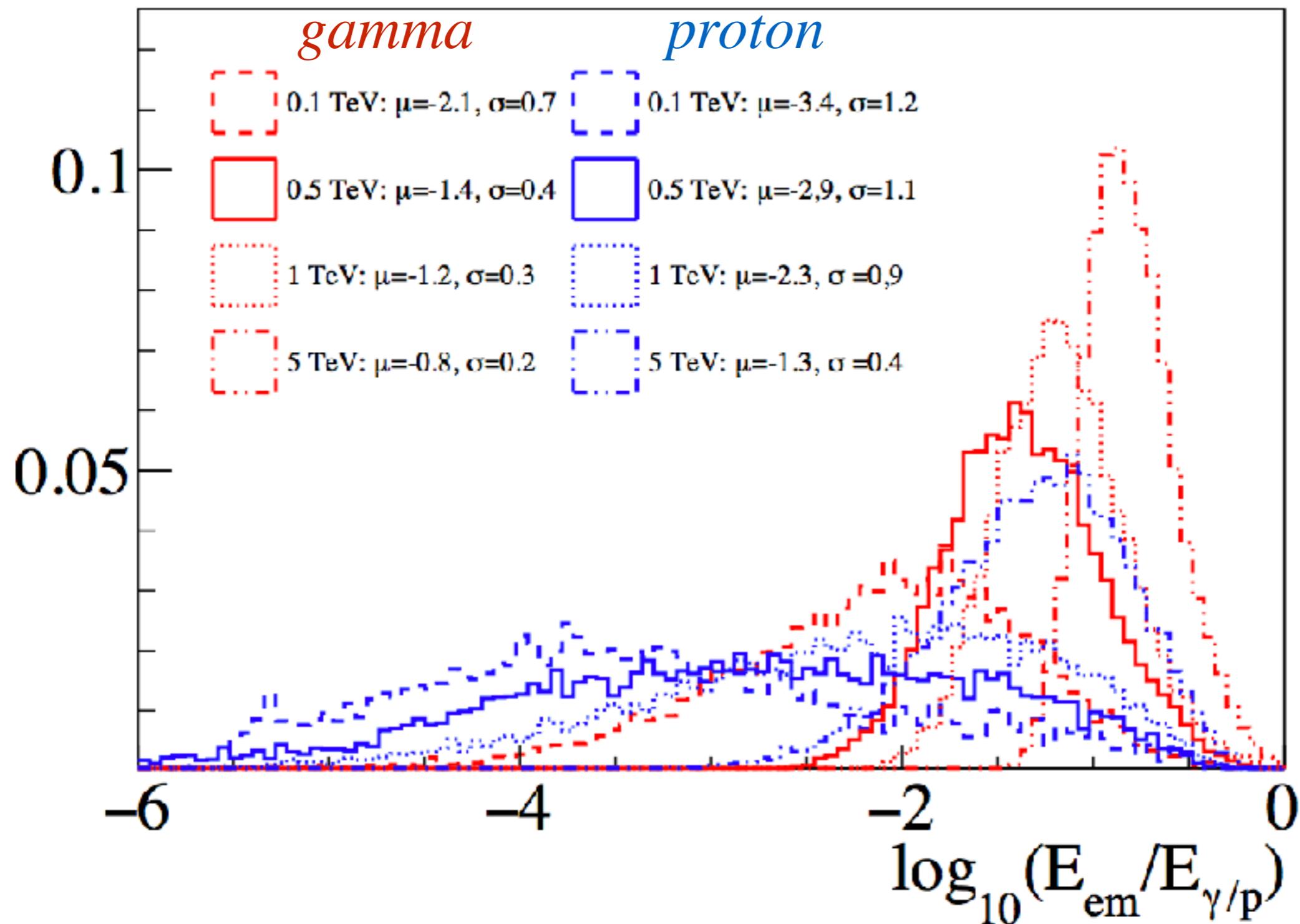
## *Atmospheric density, Slant depth*



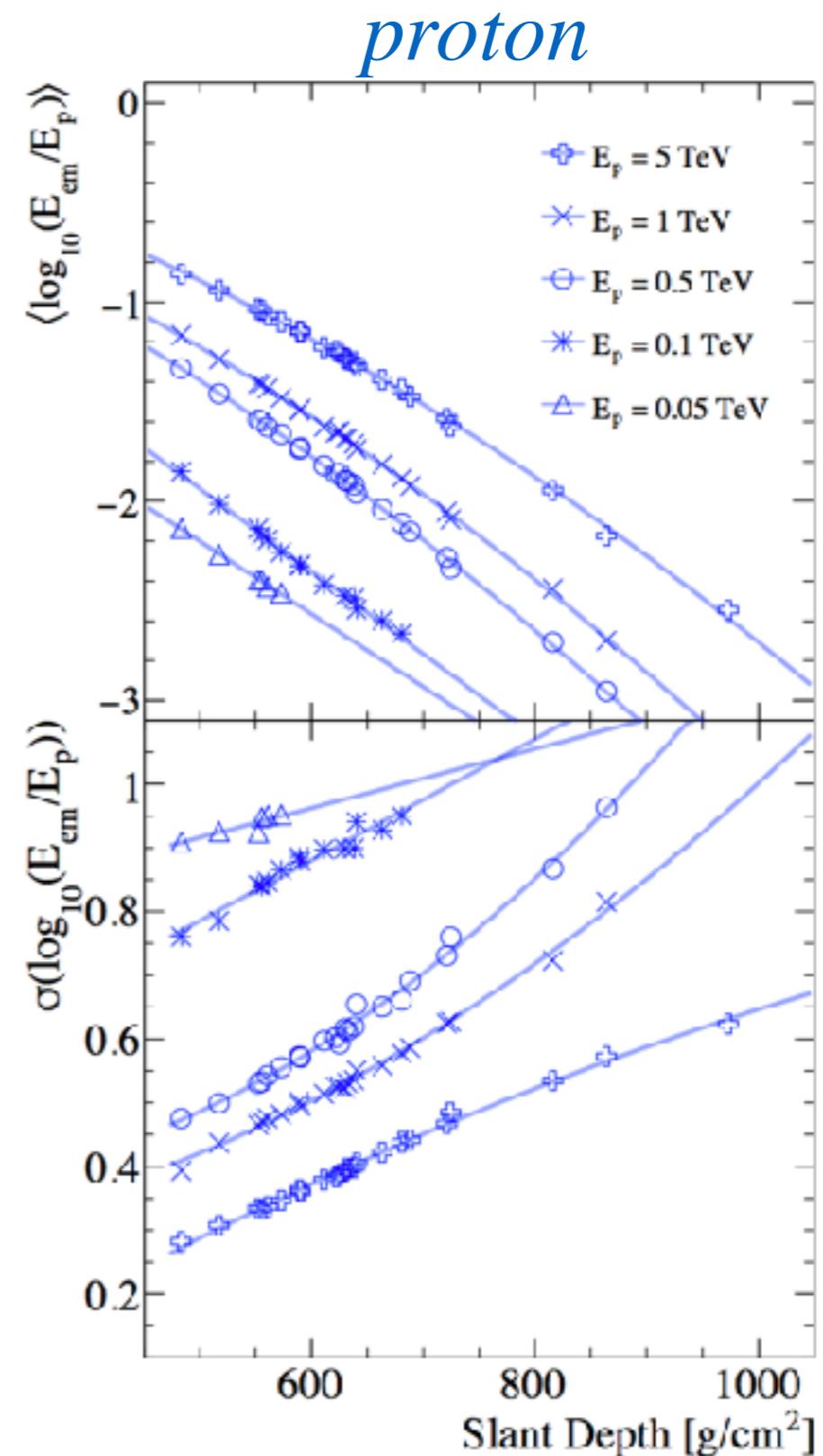
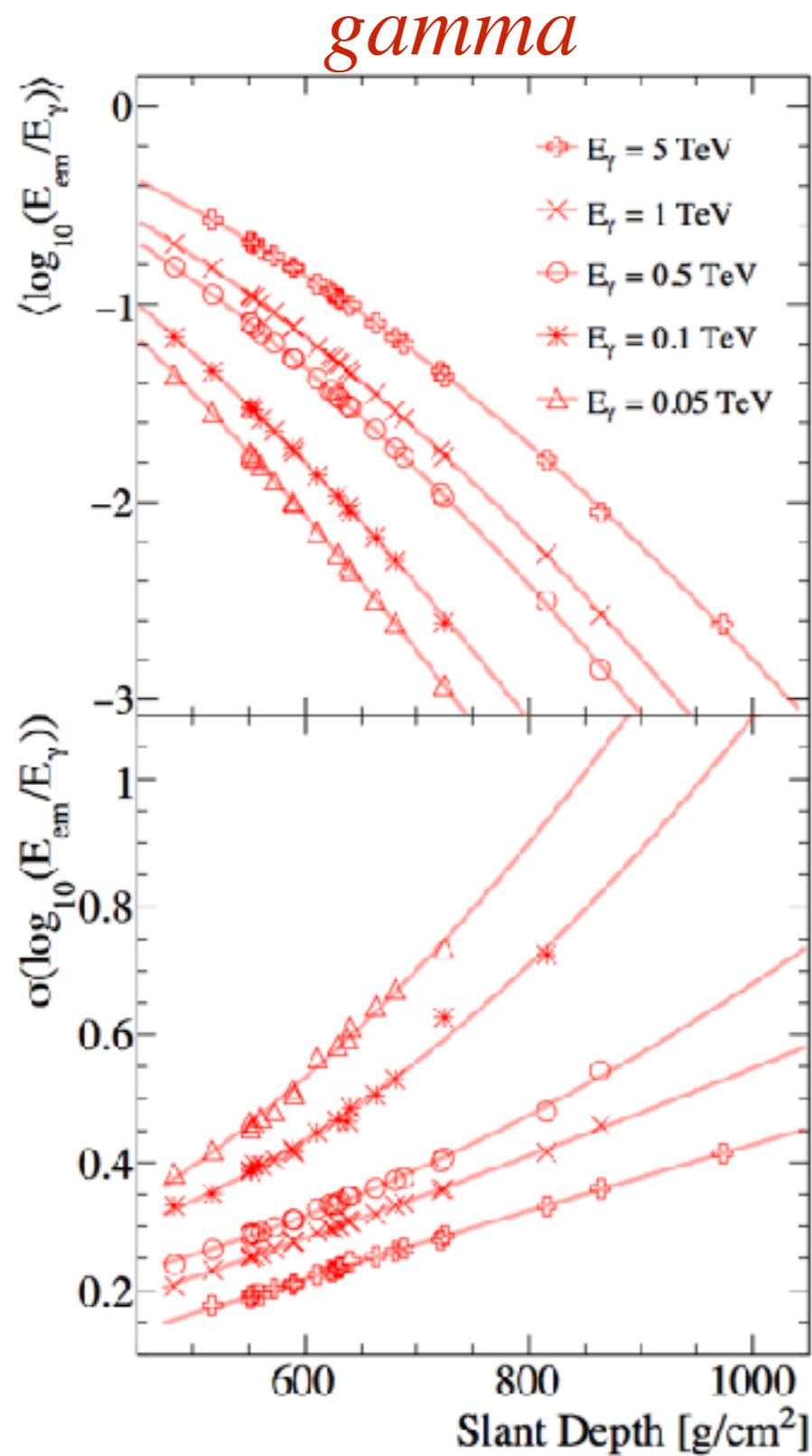
## *Example of shower parameters at 5000m vertical showers*



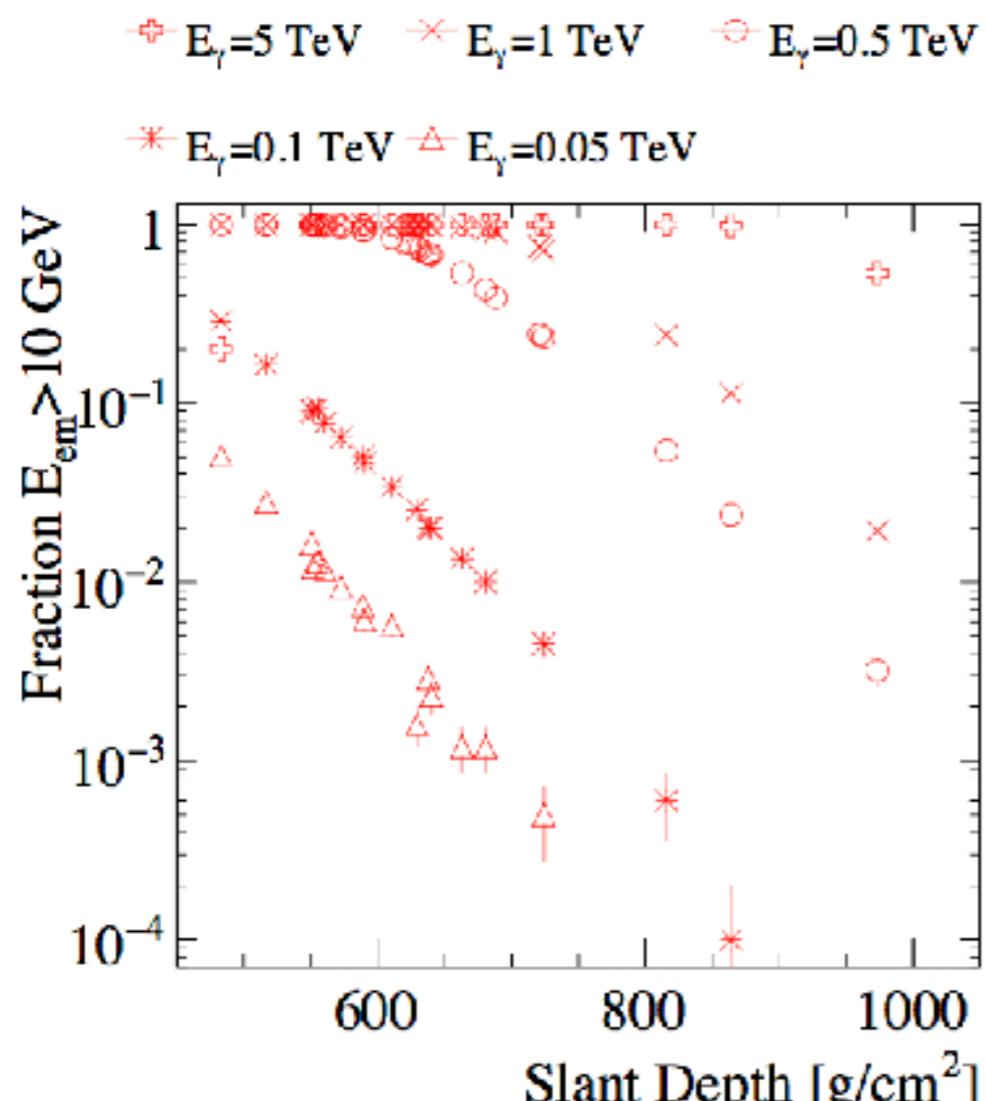
## *Distributions of fraction of energy in $\gamma$ and $e^\pm$*



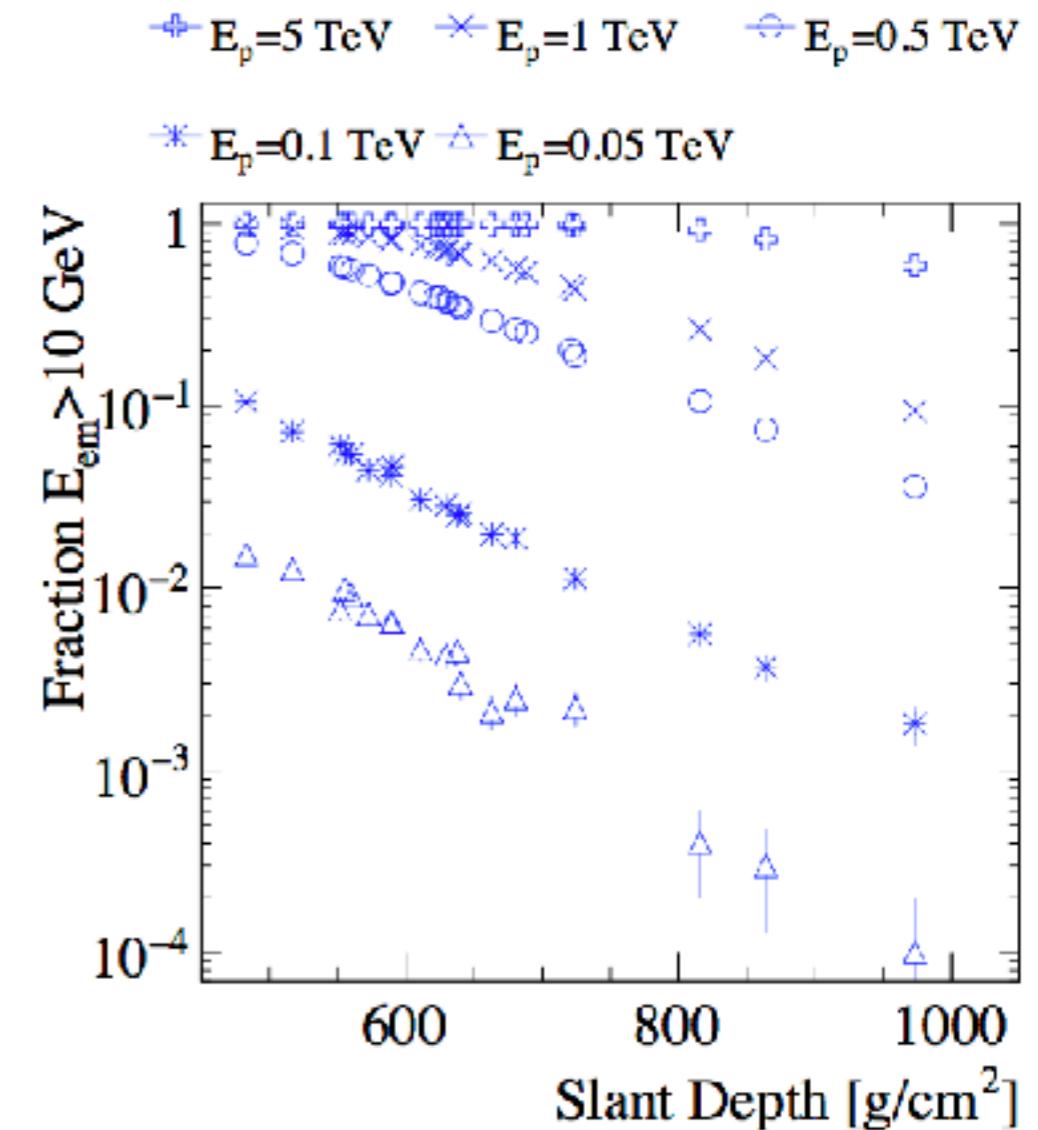
# Parameterization of fraction of energy in $\gamma$ and $e^\pm$



## *Fraction of showers above a fixed threshold*

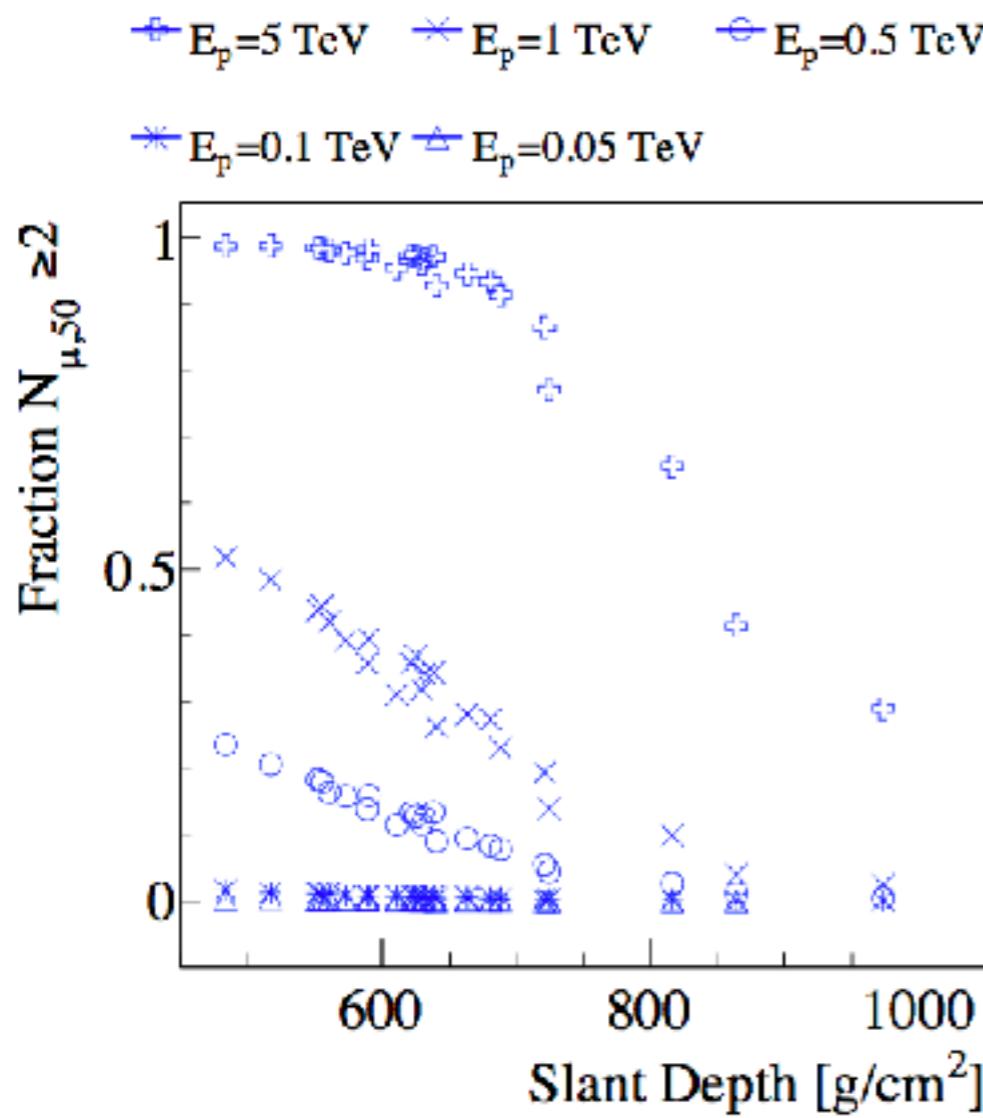


*gamma*

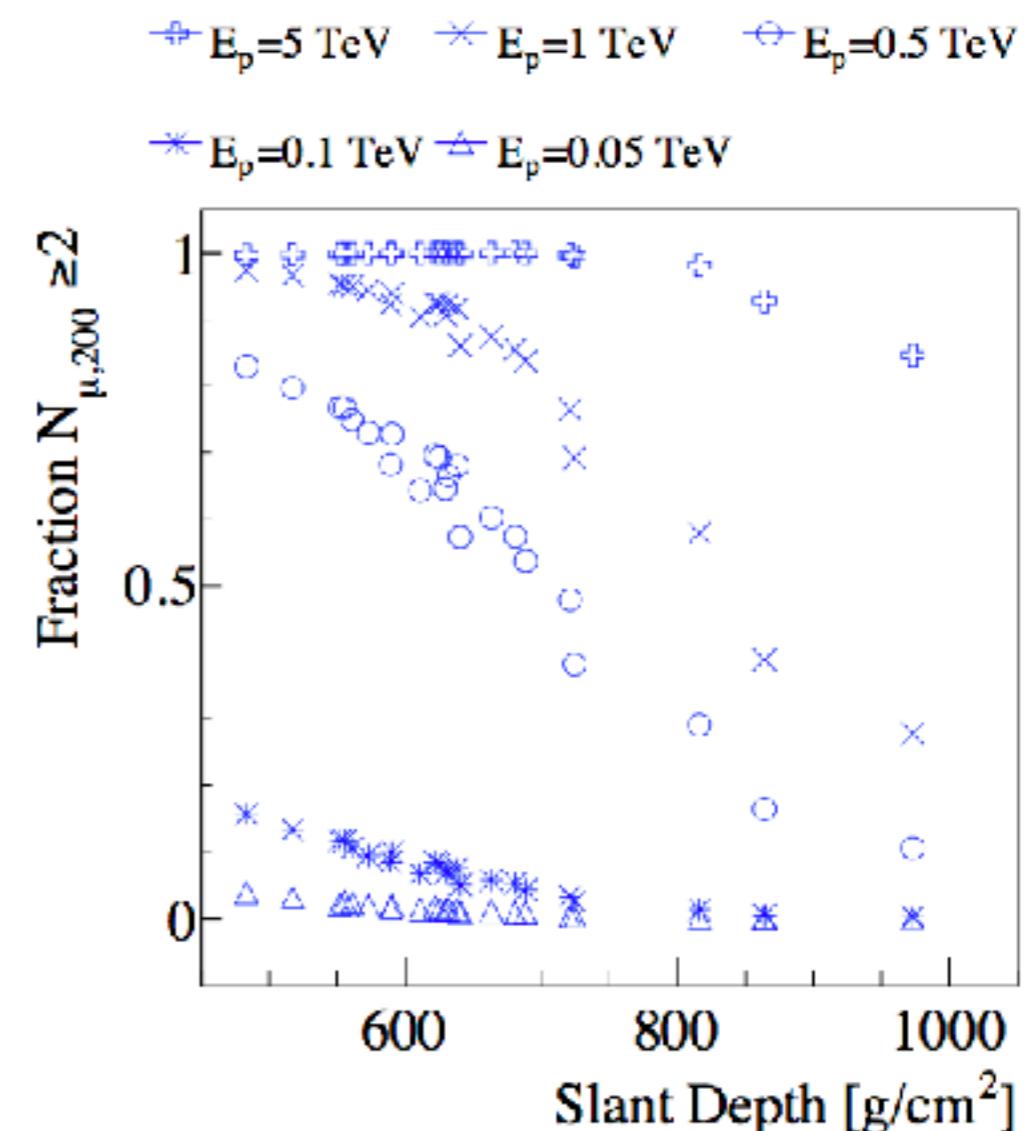


*proton*

*Muons:*  
*at least two muons within a radius from the core*



*within 50 from core*



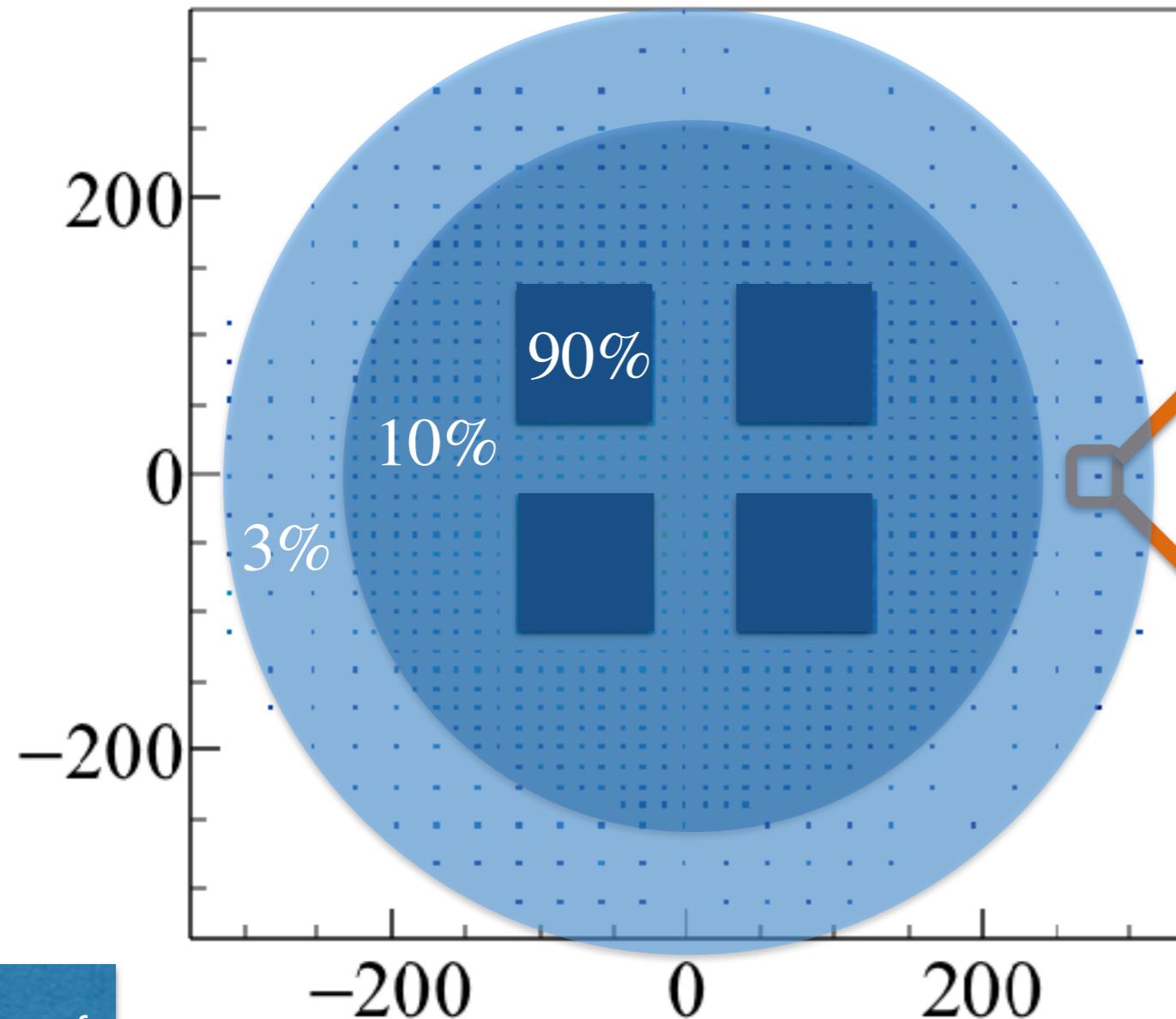
*within 200 from core*

## Mixed arrays

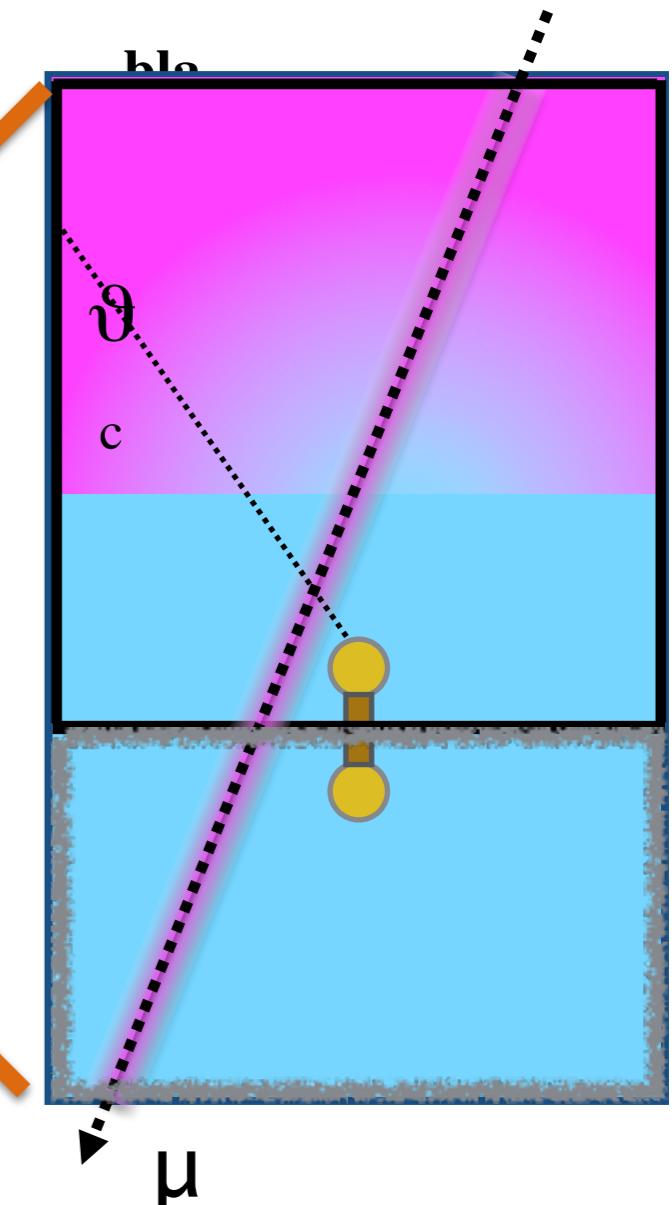
*results not at ICRC, but use it reconstruction ...*

# Detector concept

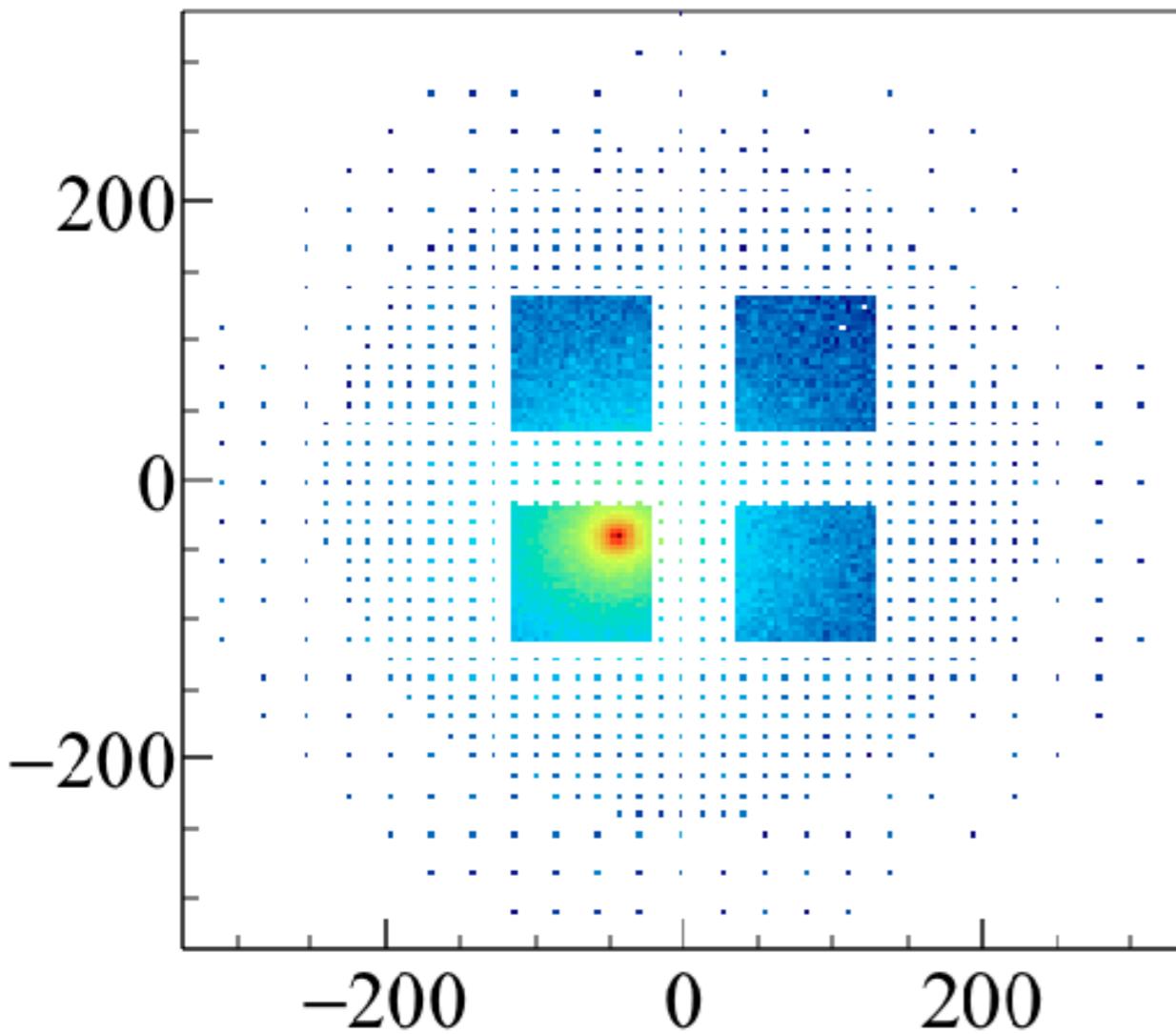
*mixed density array:*



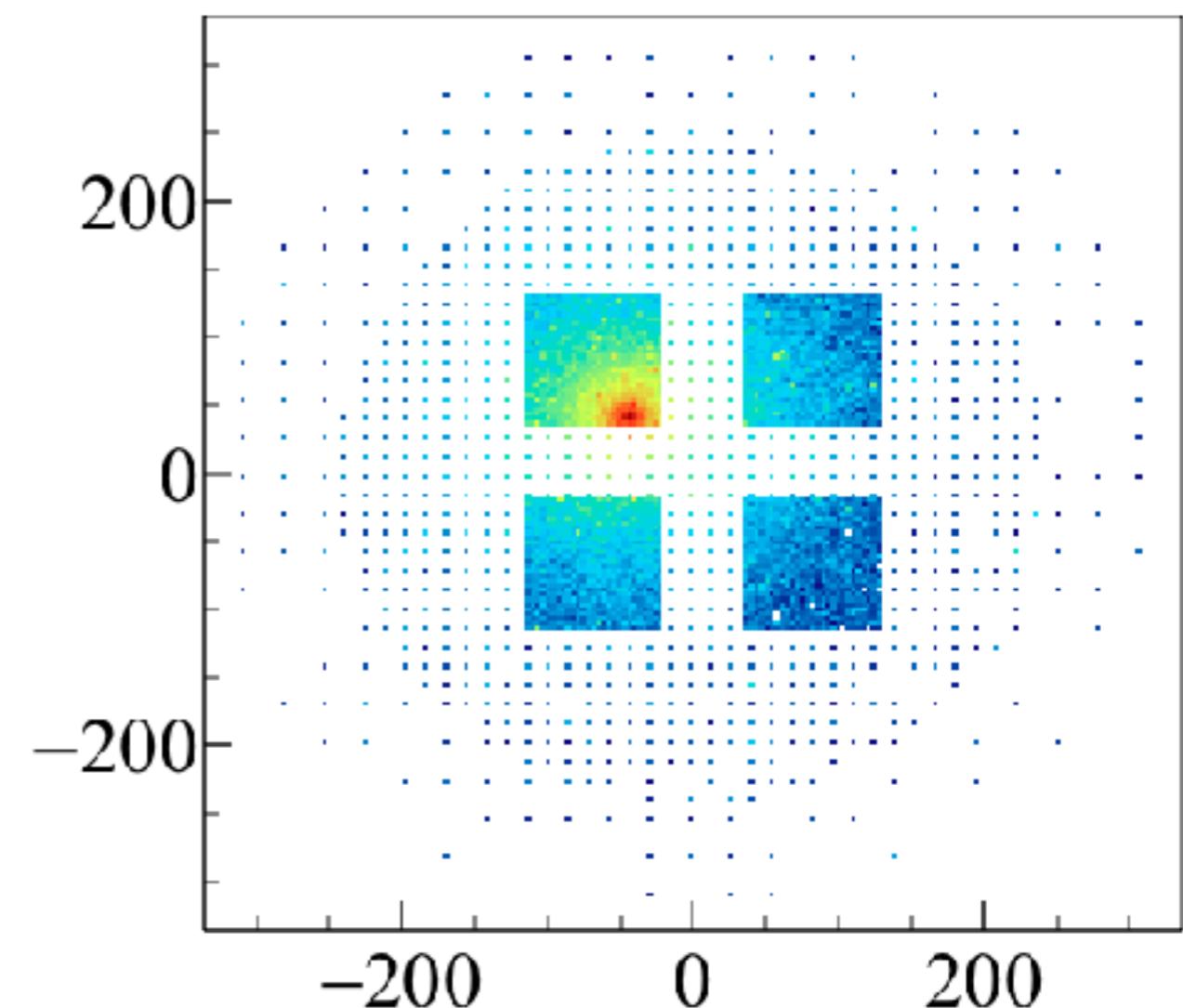
*Optical isolated  
WCD- units:*



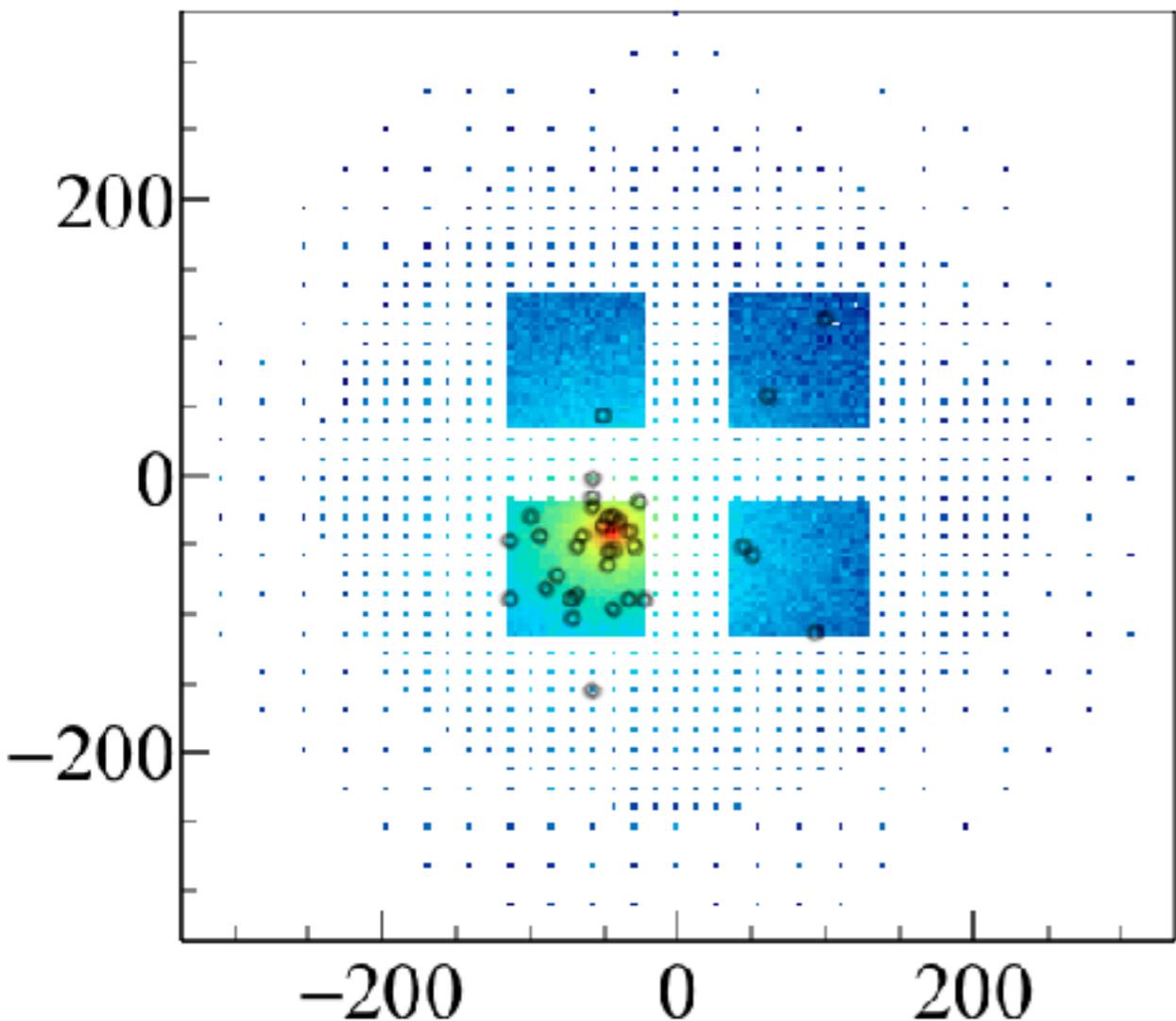
gamma ray



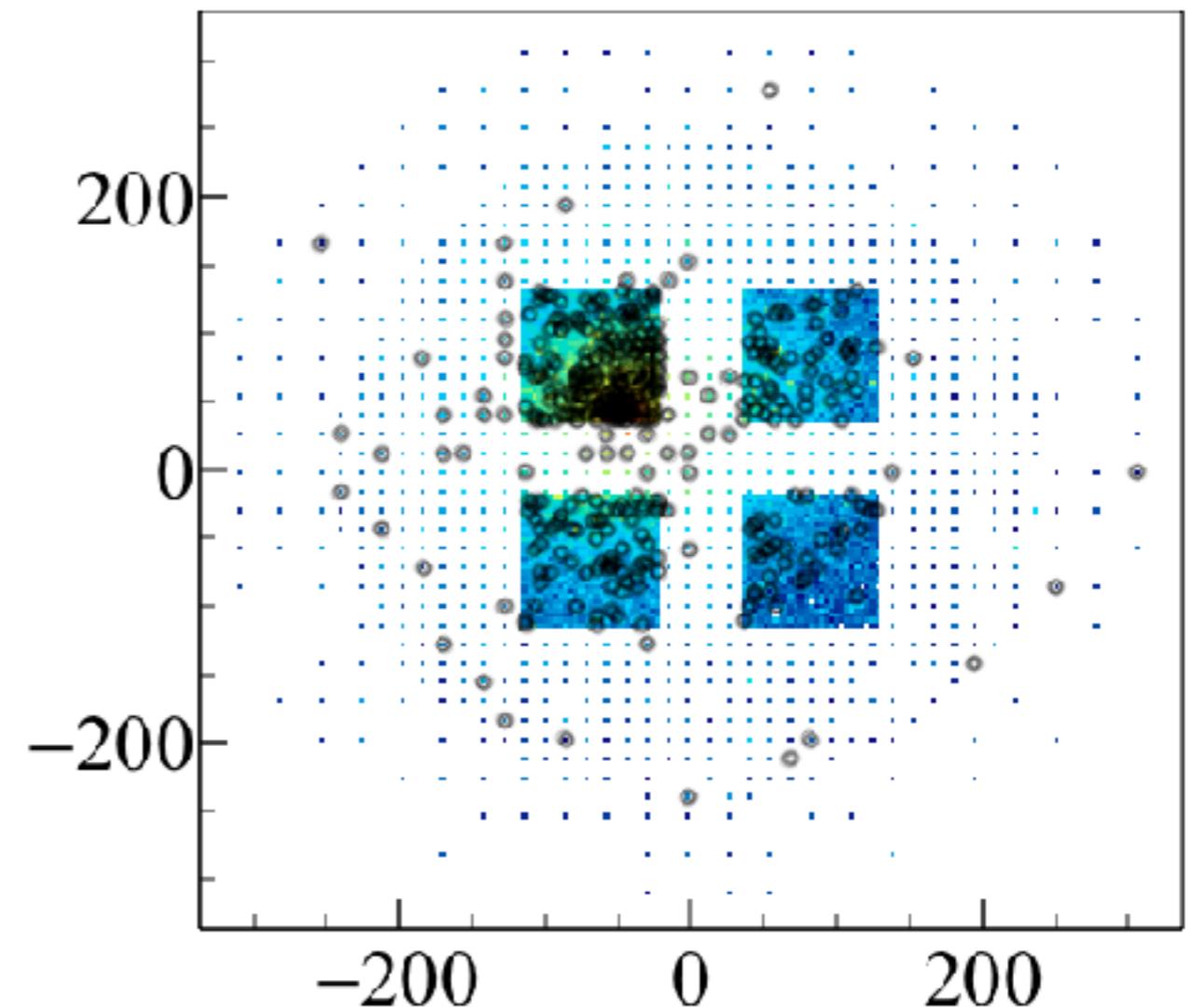
proton



gamma ray

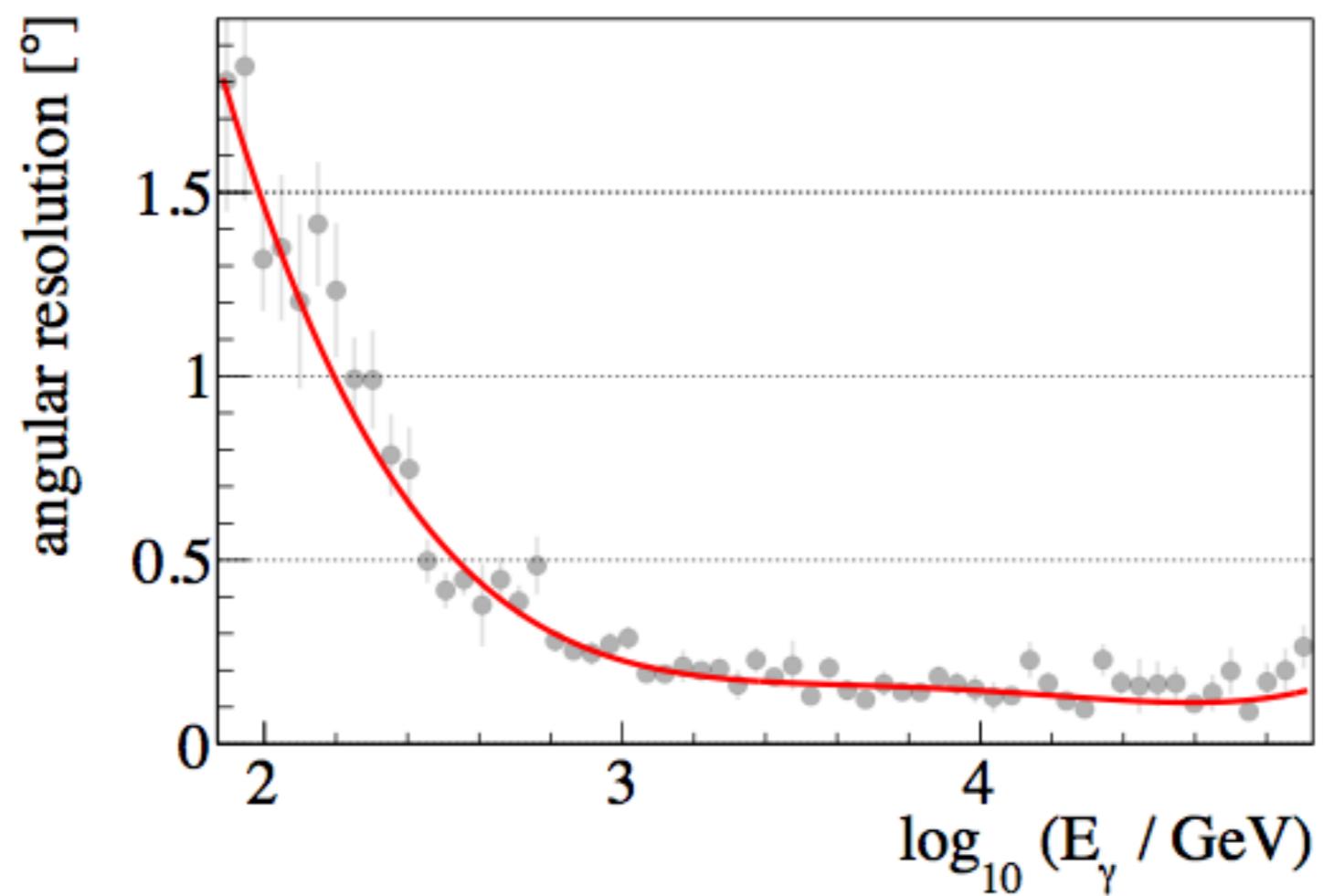


proton



**muons!**

## *Angular reconstruction using likelihood fit*



## *A reference observatory*

Altitude = 5000m

Fill Factor = 1

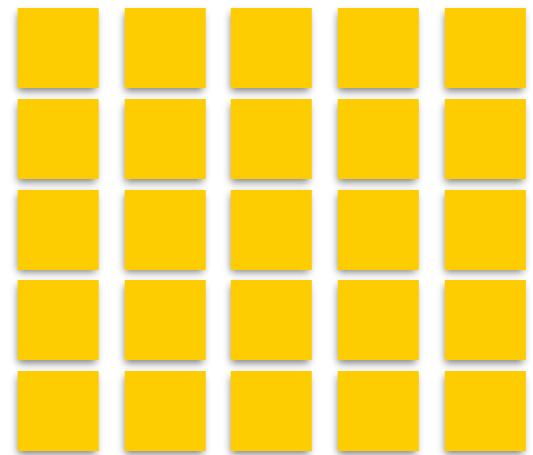
Unit size = 4m x 4m

Array size = 200m x 200m

Unit Energy Threshold = 10 MeV

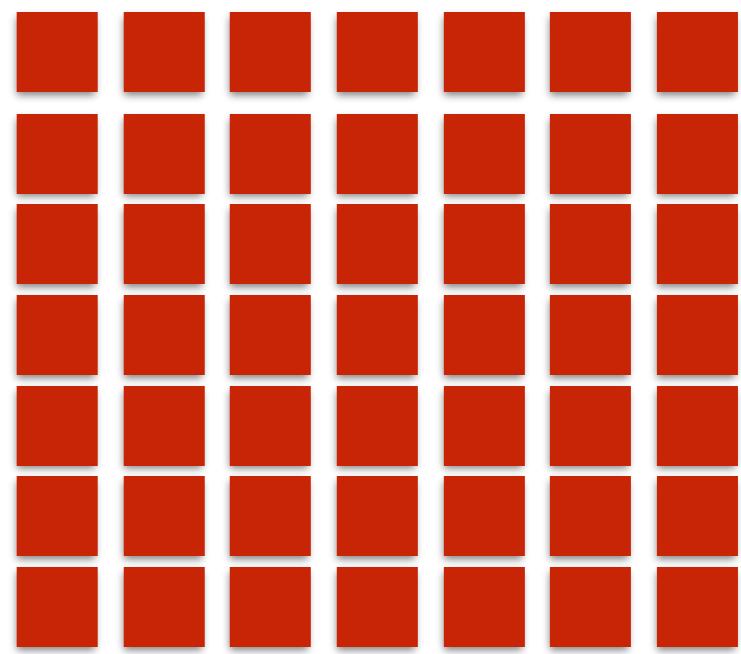
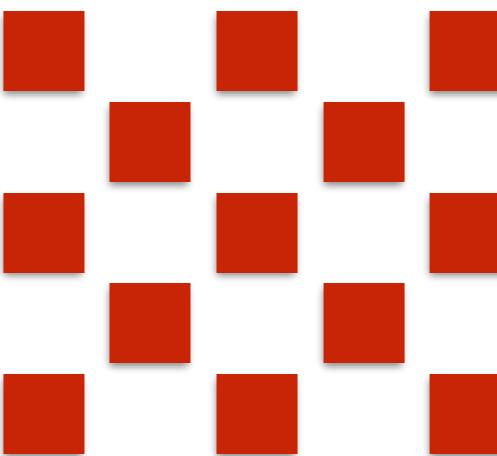
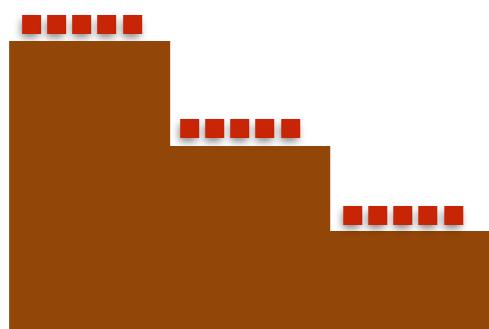
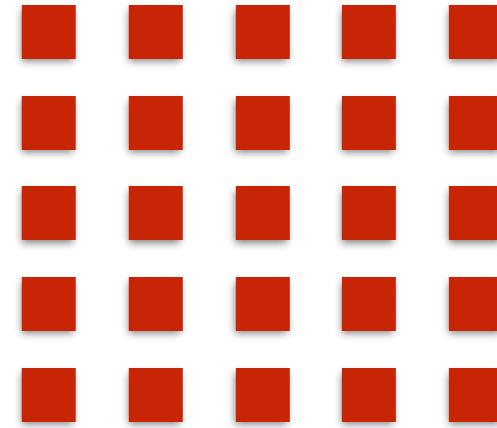
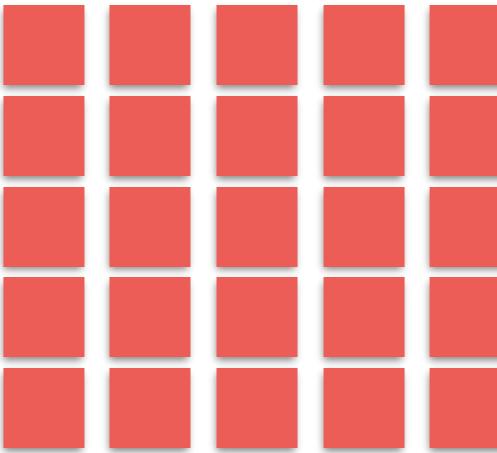
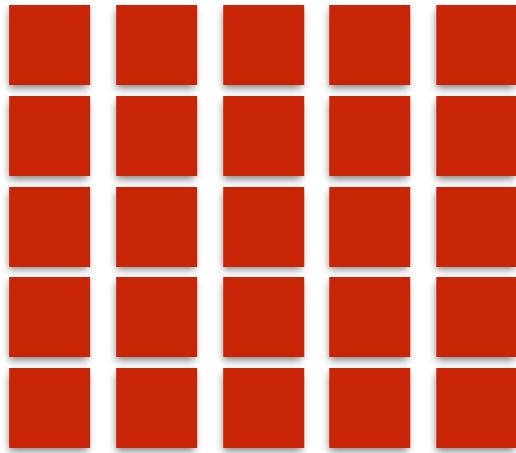
Trigger Multiplicity > 10

Events from zenith = 20, on the array and uniformly distributed on array

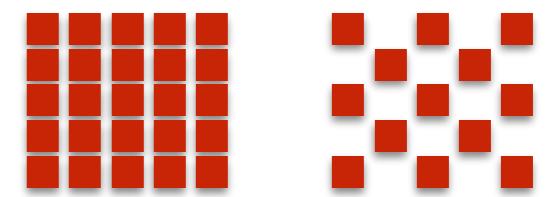


**Assumed: Muon counter  
array + perfect EM-  
calorimeter of same  
dimensions**

## *Different (uniform) array properties*

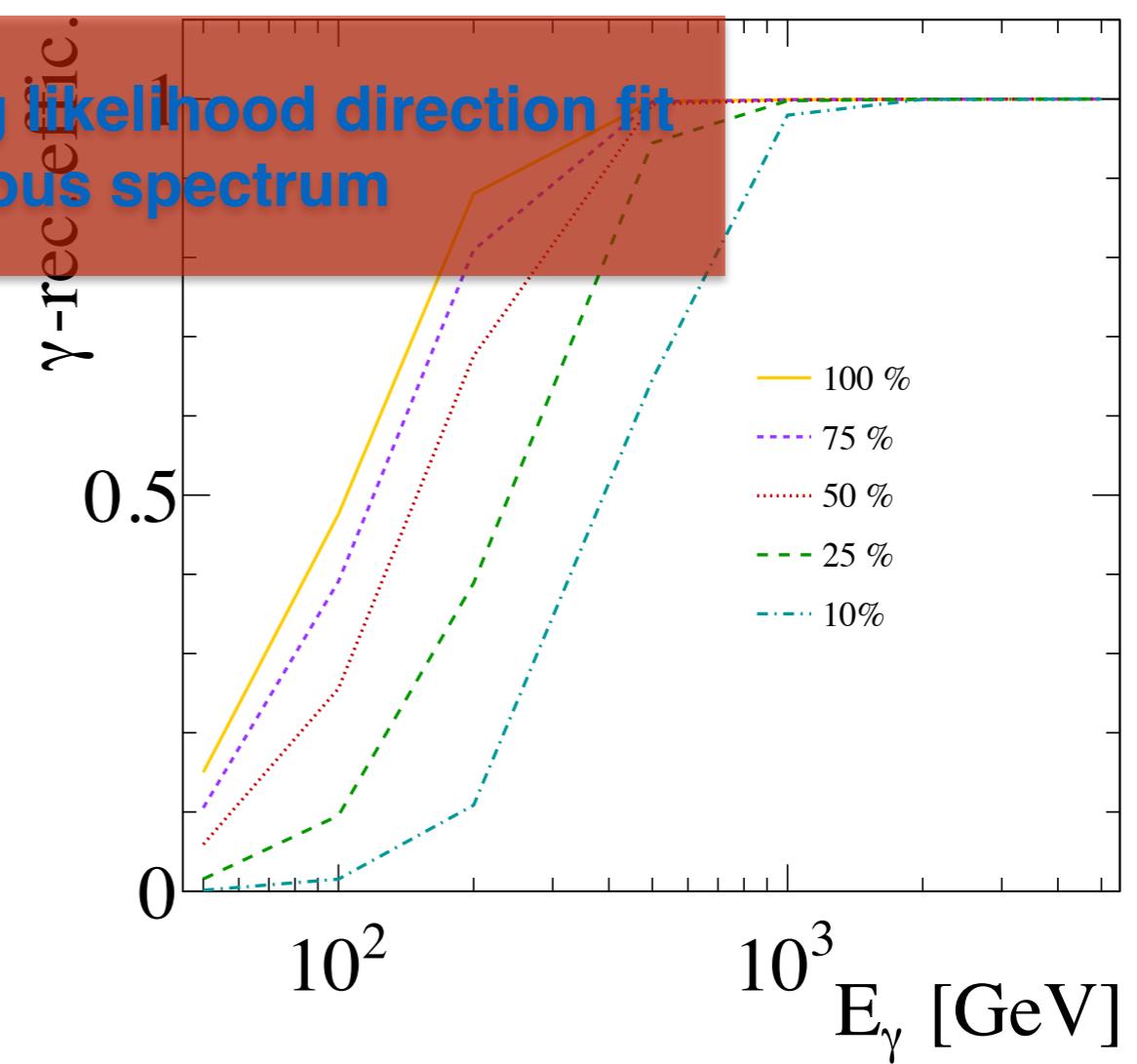
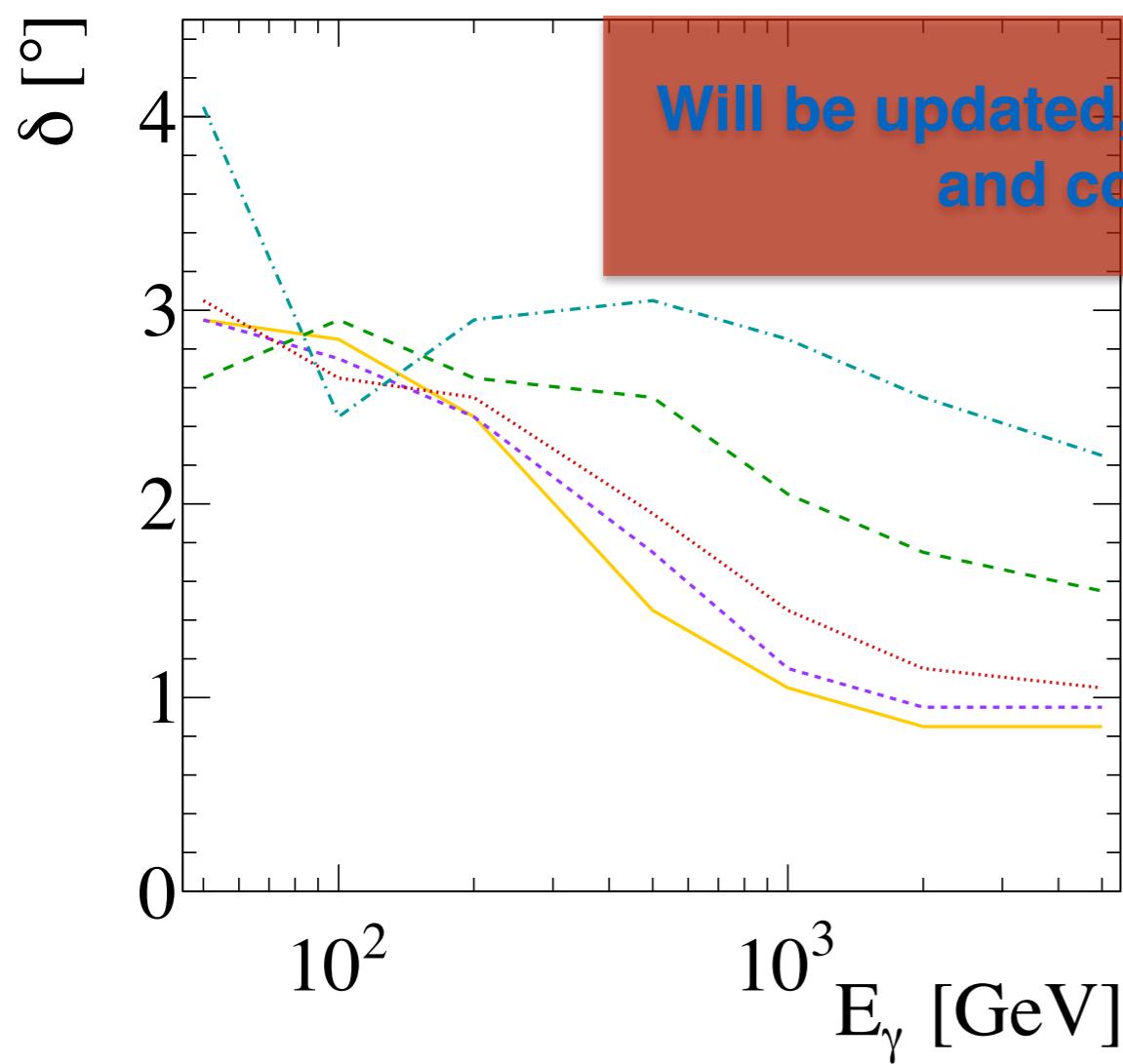


*Unit density*

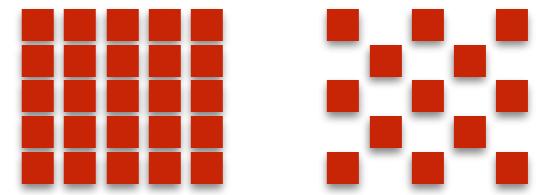


“Simple Angular reconstruction”  
plane shower front

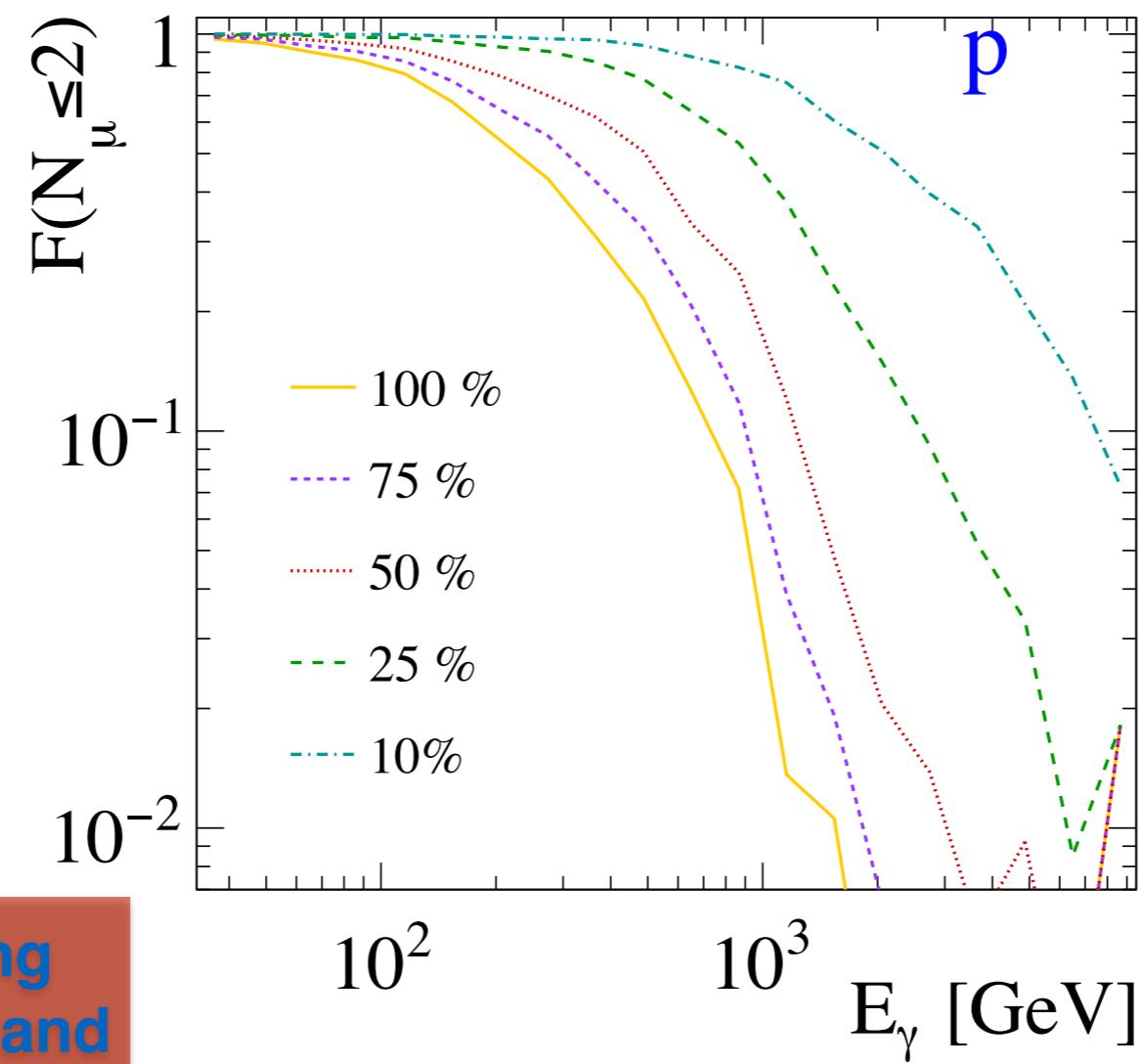
“Events failing simple fit...”



*Unit density*

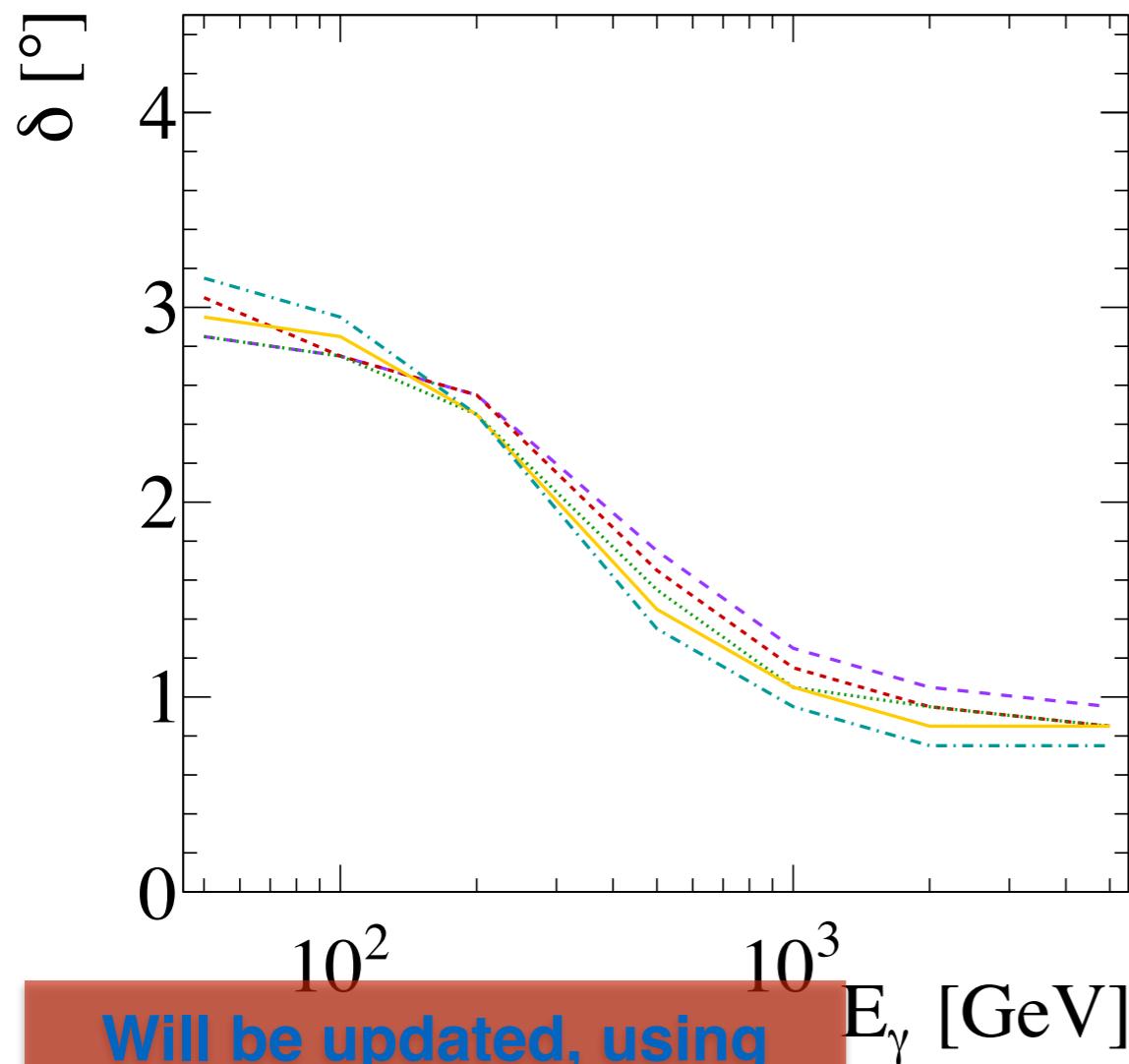
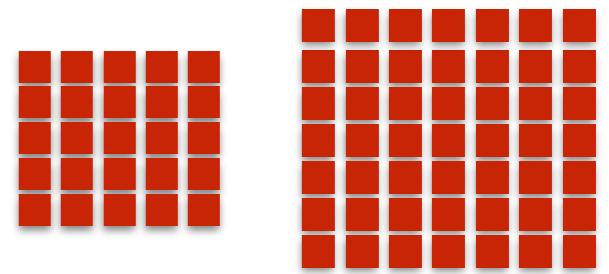


“Naive Gamma hadron separation”:  $N_\mu \geq 2$

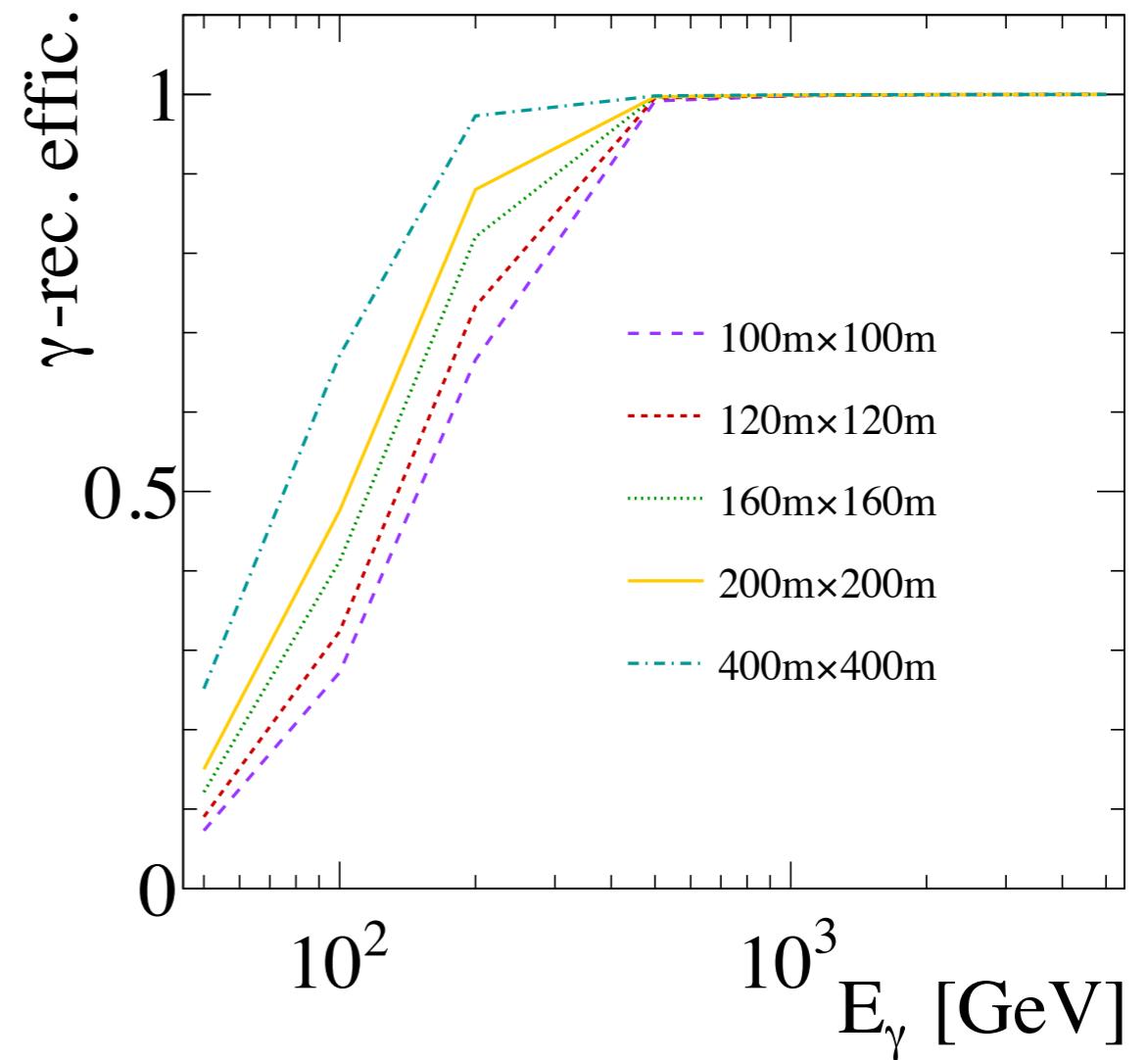


Will be updated, using  
likelihood direction fit and  
continuous spectrum

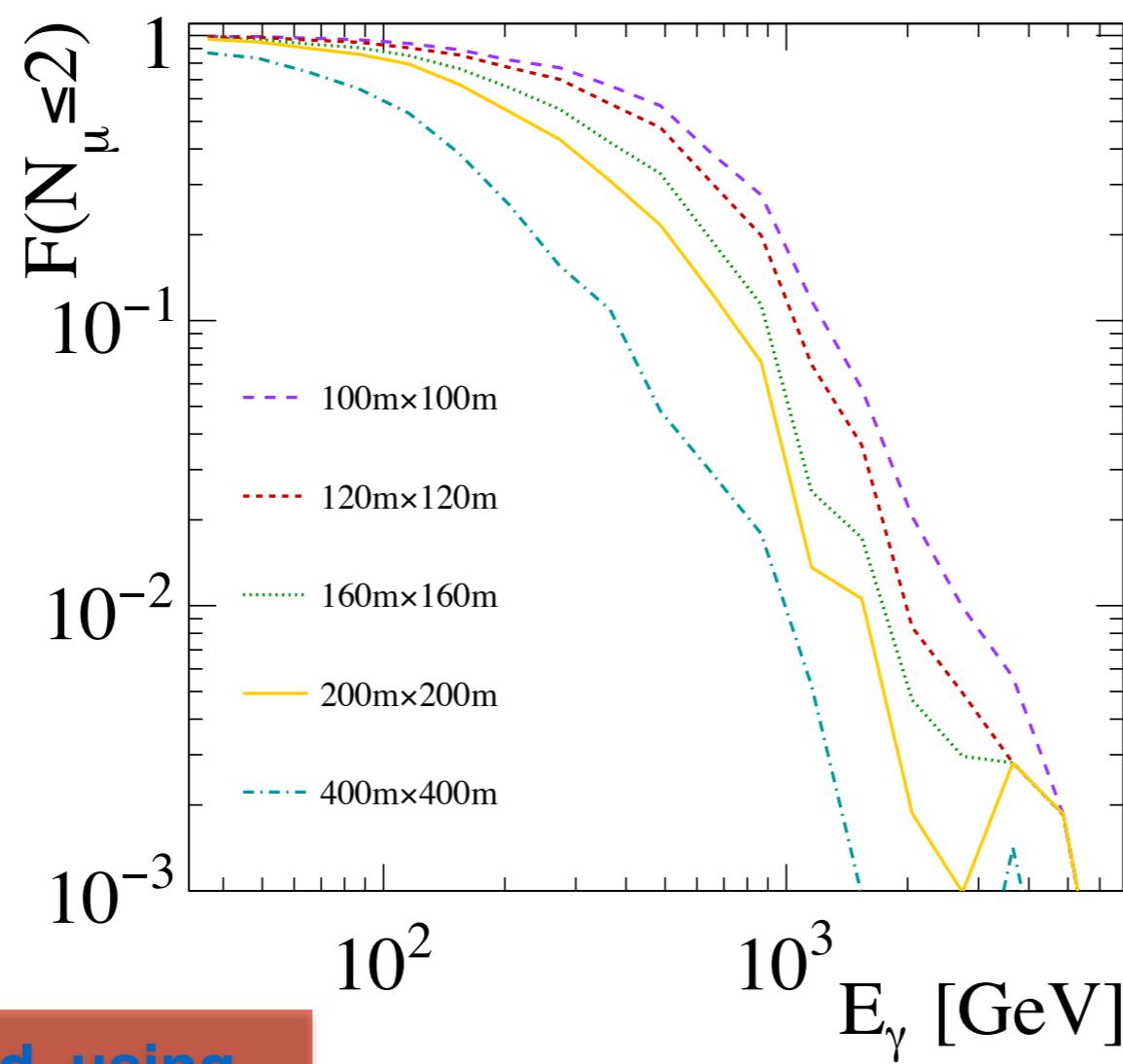
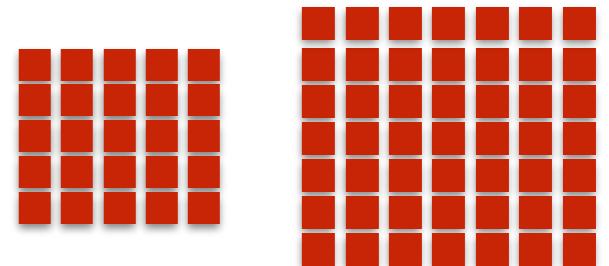
*Array size*



Will be updated, using  
likelihood direction fit and  
continuous spectrum

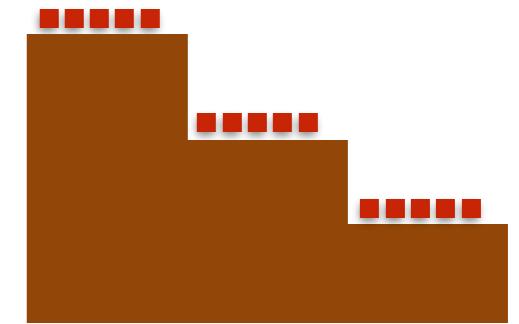


*Array size*

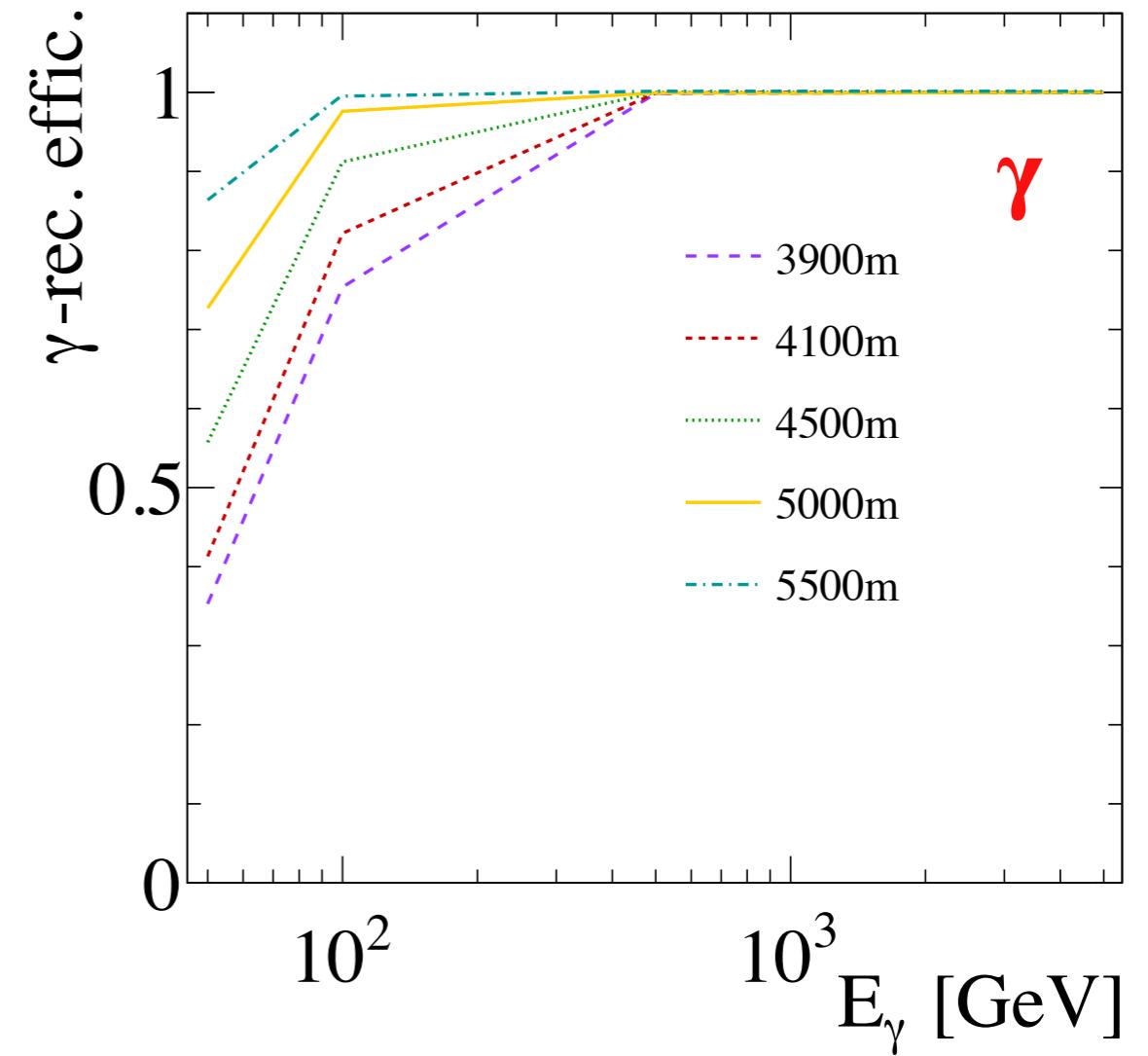
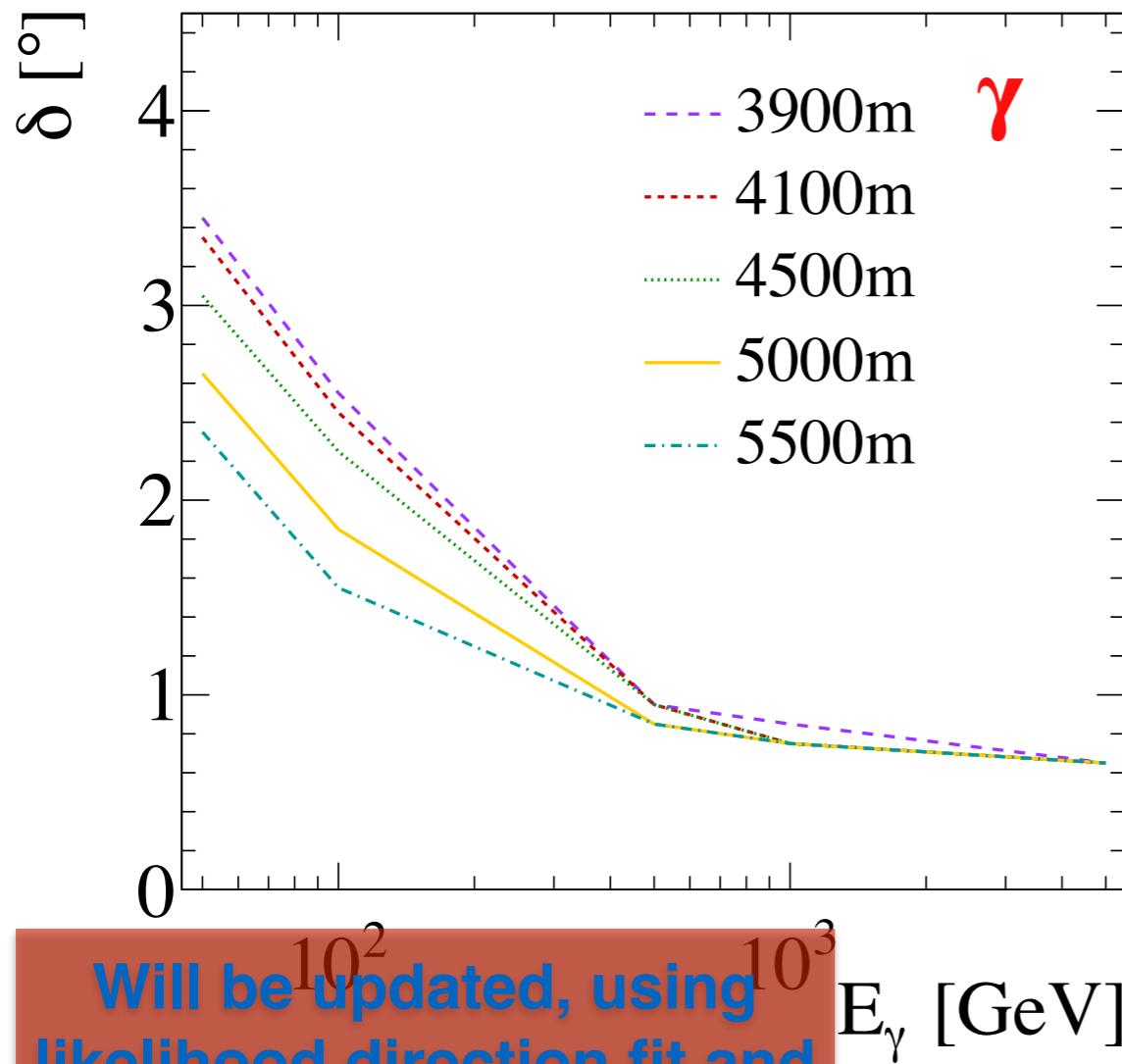


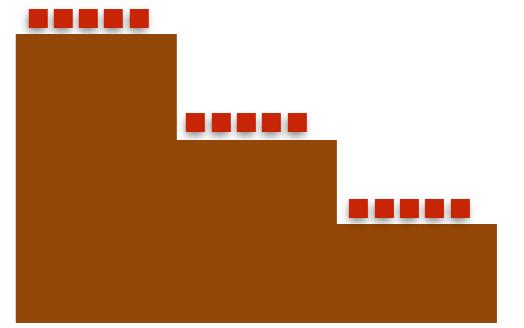
Will be updated, using  
likelihood direction fit and  
continuous spectrum

## *Array altitude*



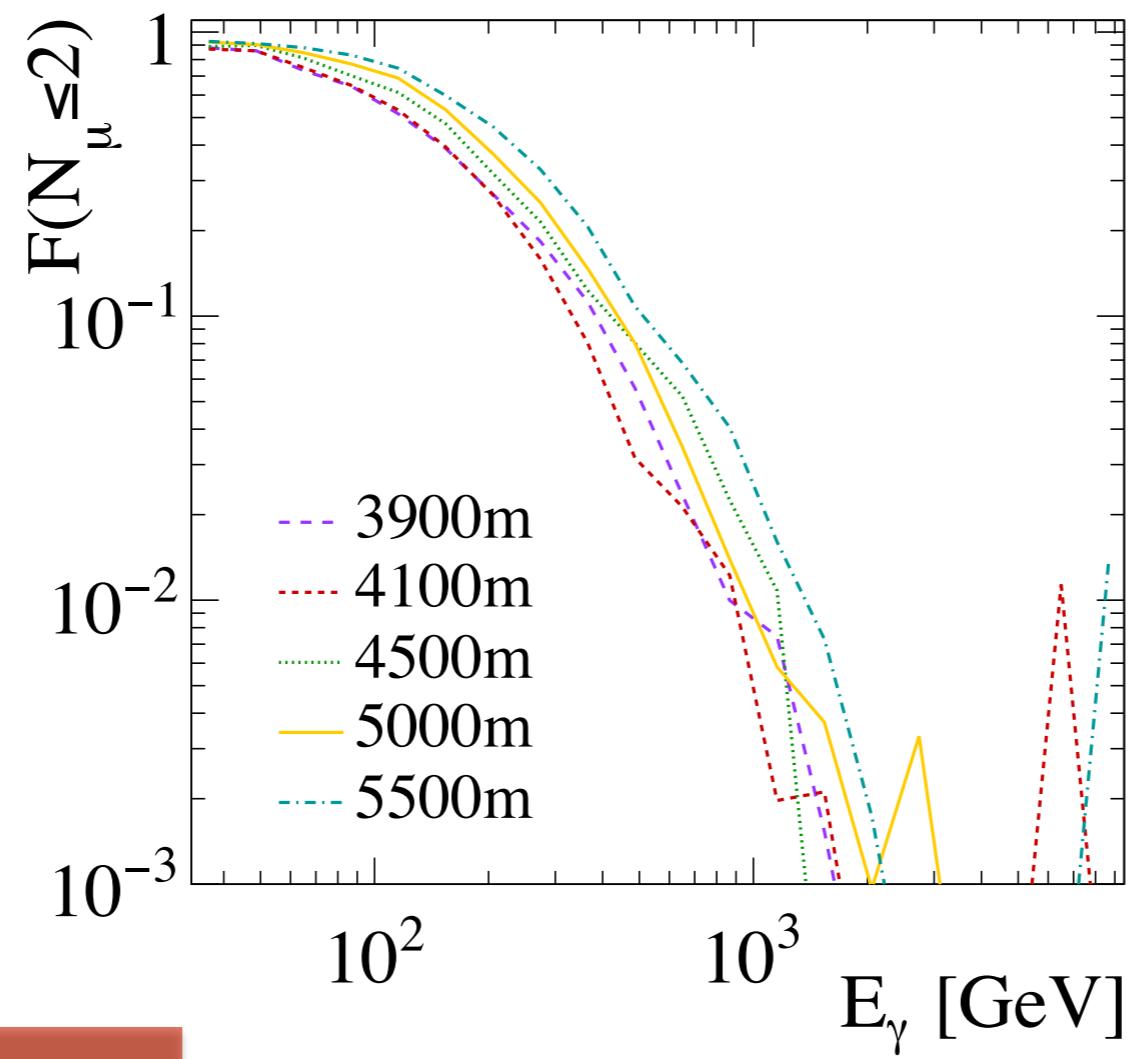
Simple old reconstructions...





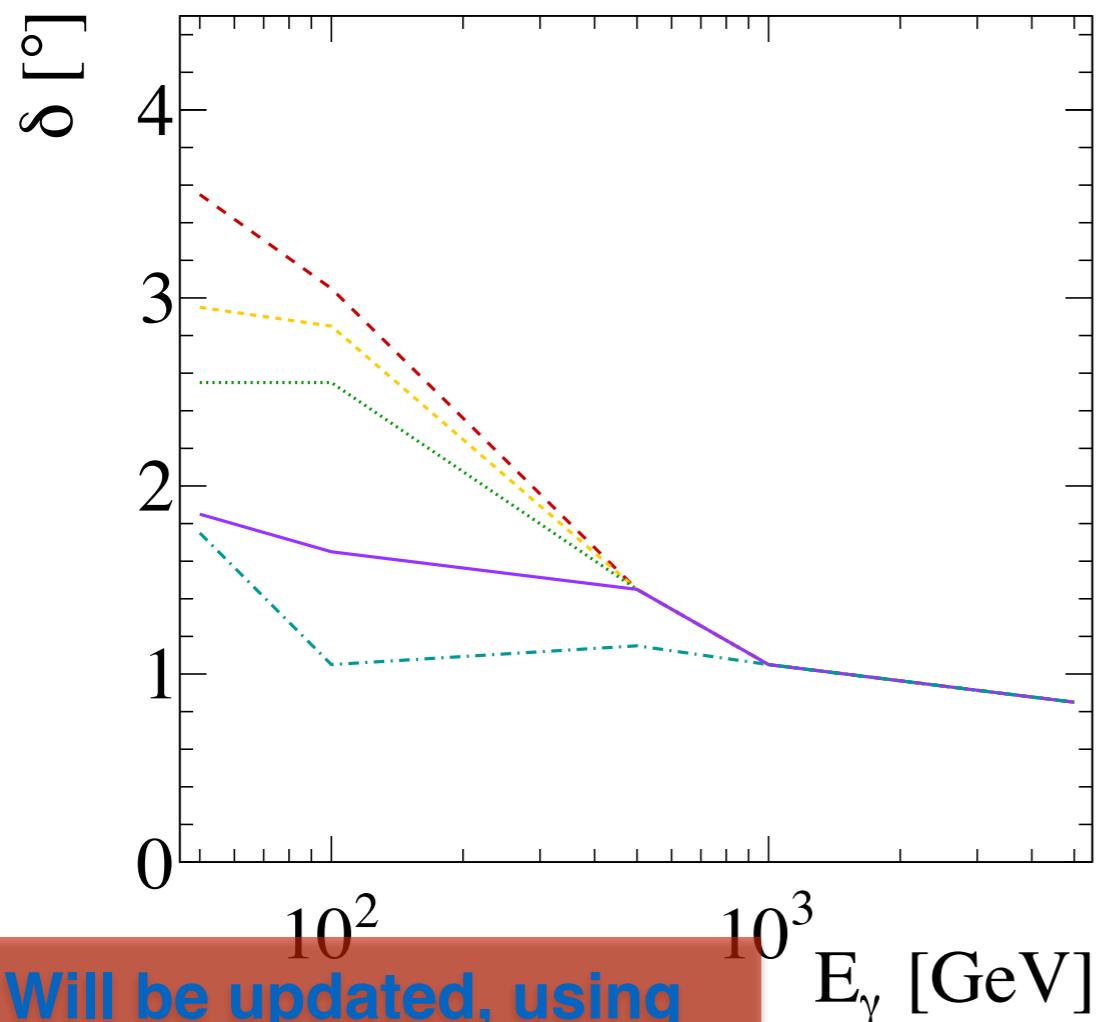
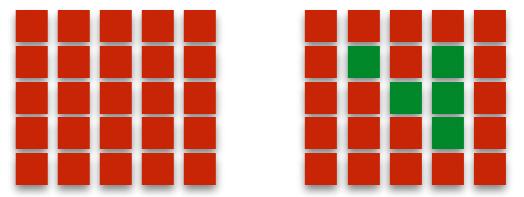
*Array altitude*

p

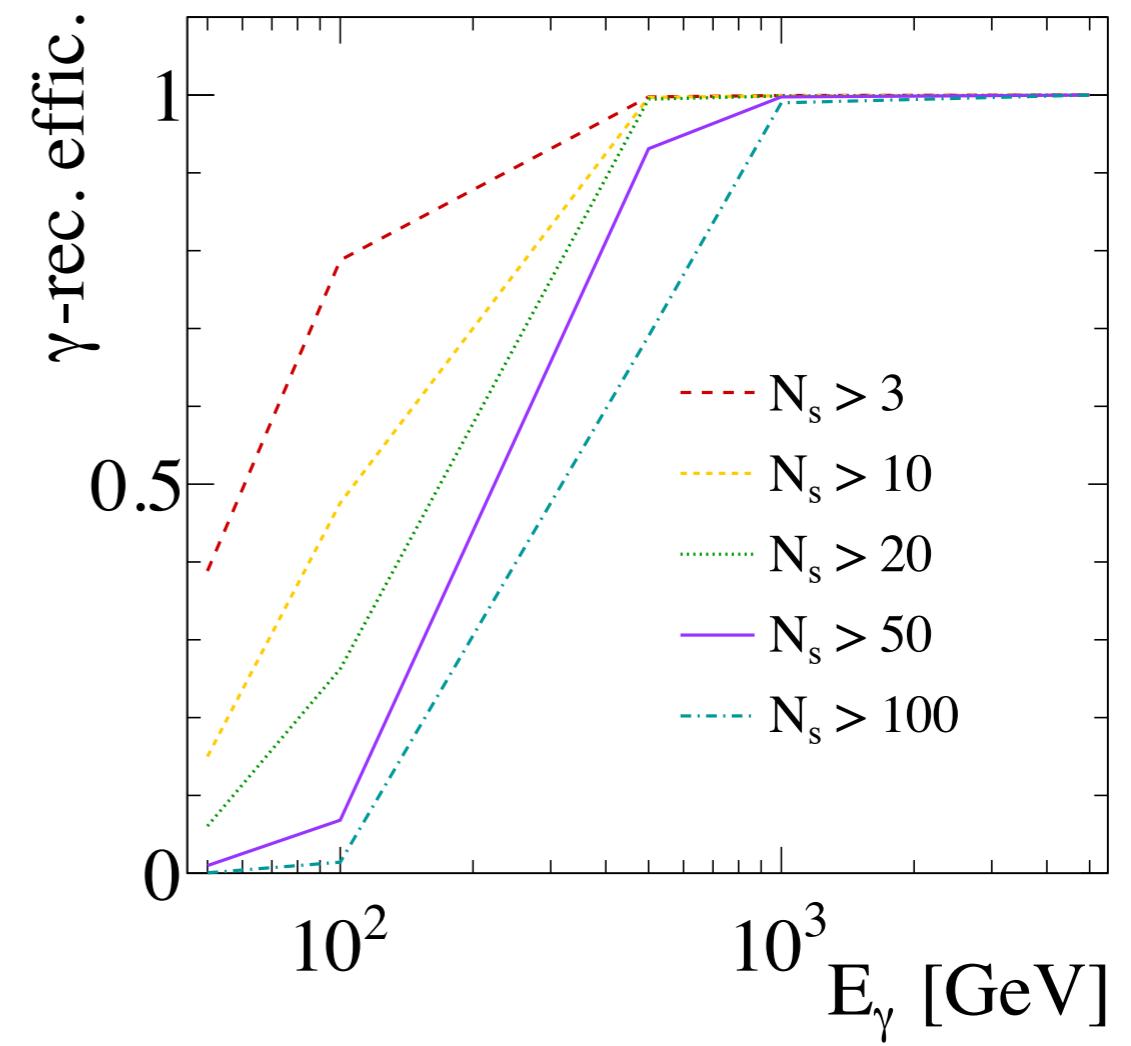


Will be updated, using  
likelihood direction fit and  
continuous spectrum

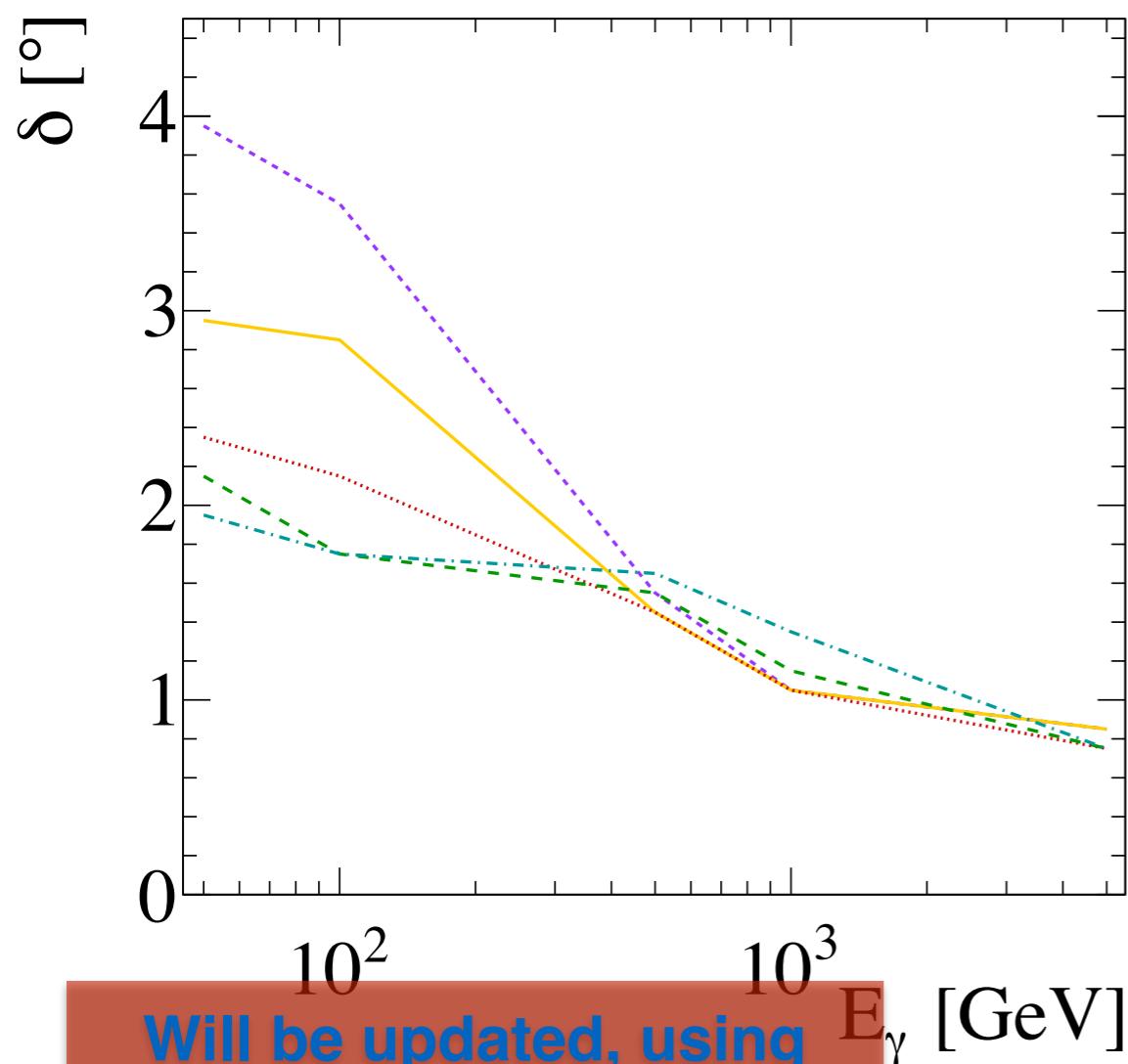
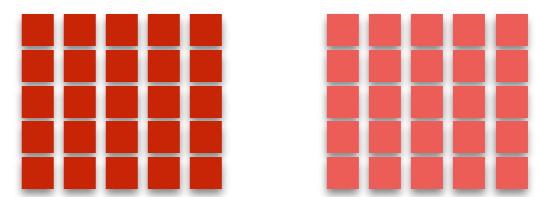
# *Trigger multiplicity threshold*



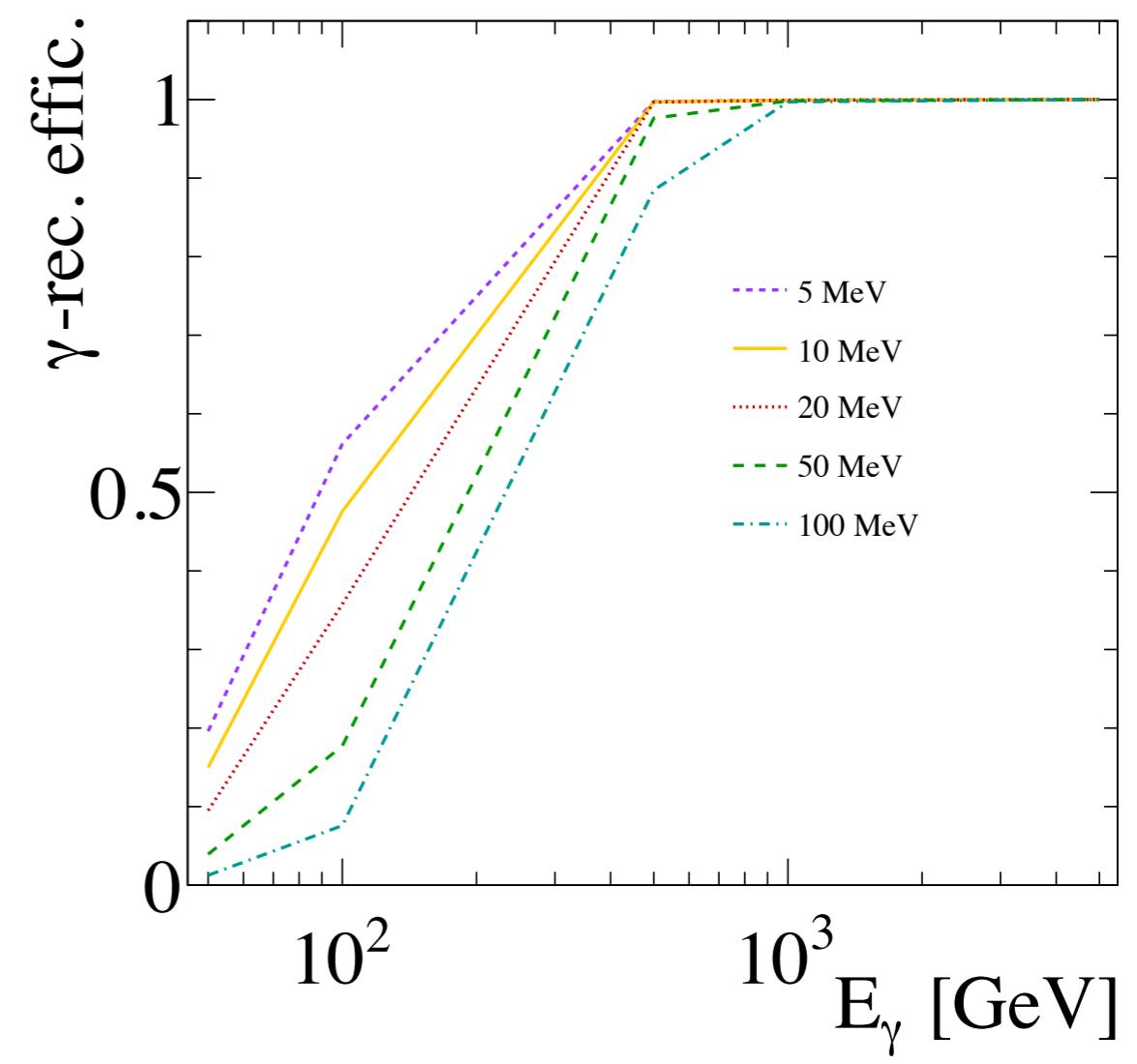
Will be updated, using  
likelihood direction fit and  
continuous spectrum



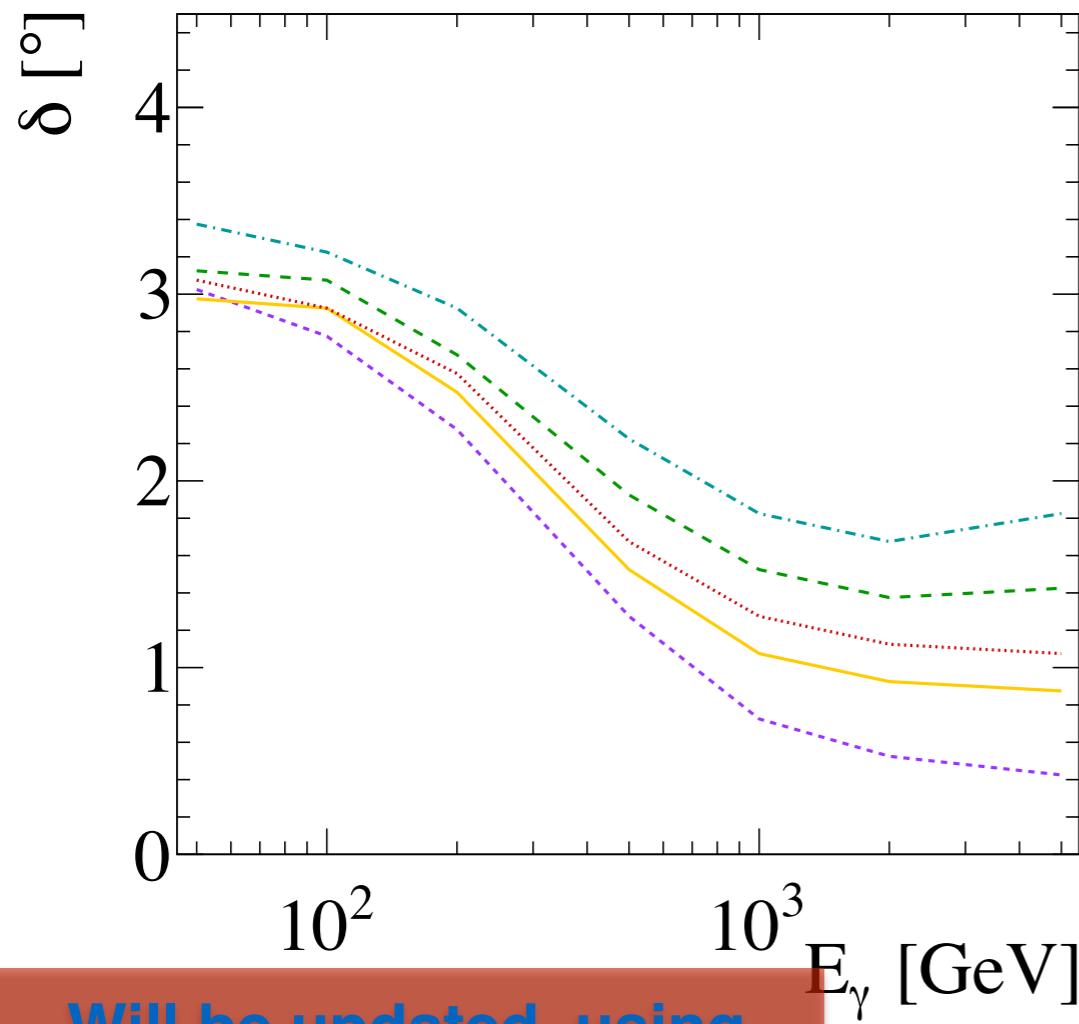
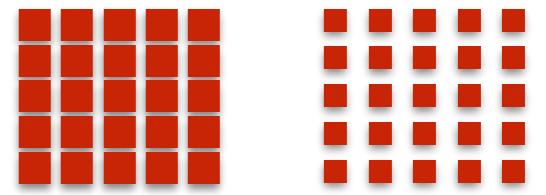
# *Energy threshold*



Will be updated, using  
likelihood direction fit and  
continuous spectrum



## *Unit size*



Will be updated, using  
likelihood direction fit and  
continuous spectrum

