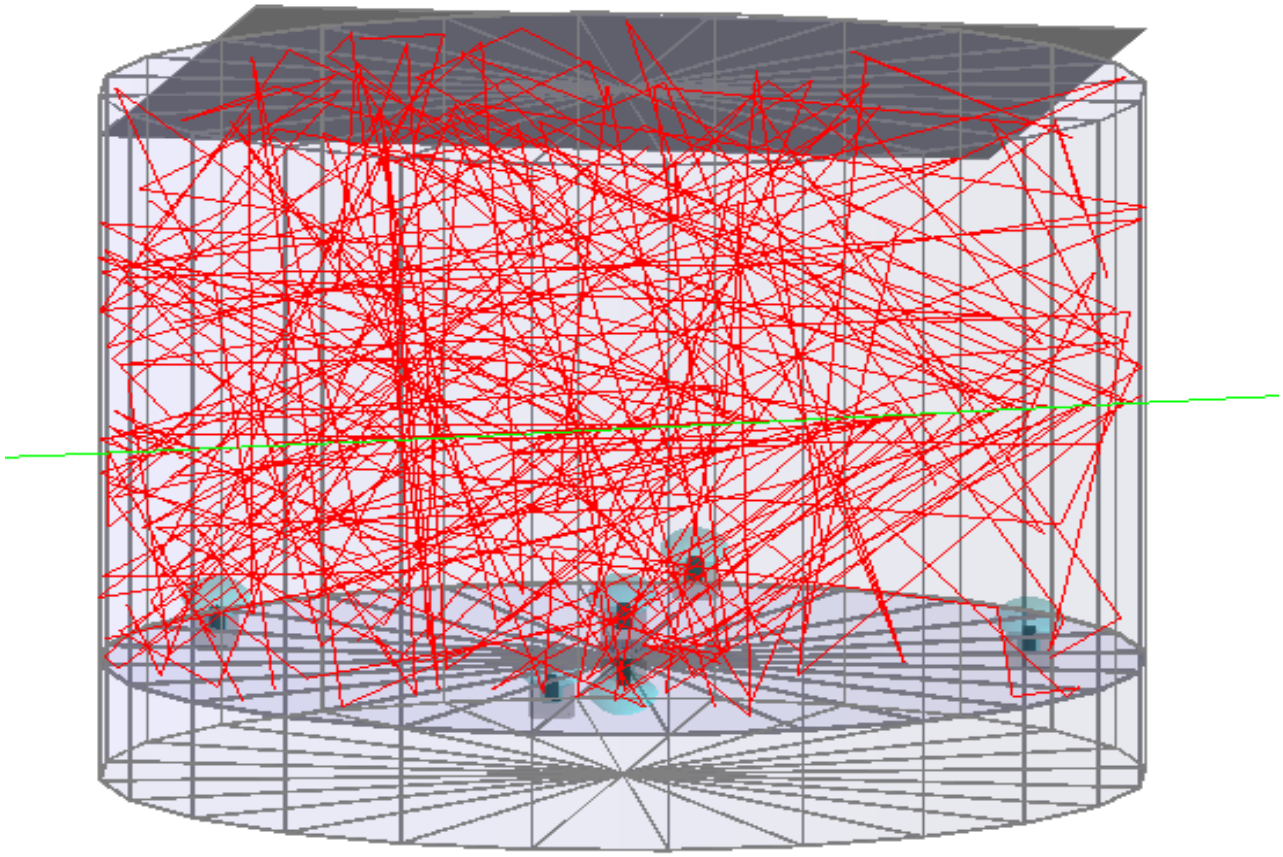
SWGO Framework with RPC

Fernanda Heredia, Claudio Casentini, Gonzalo Rodriguez



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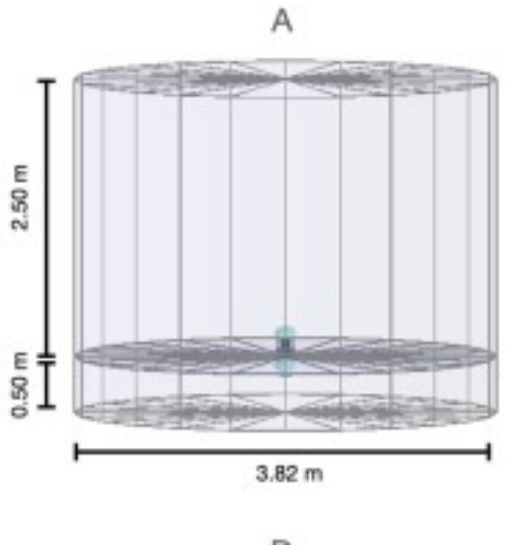
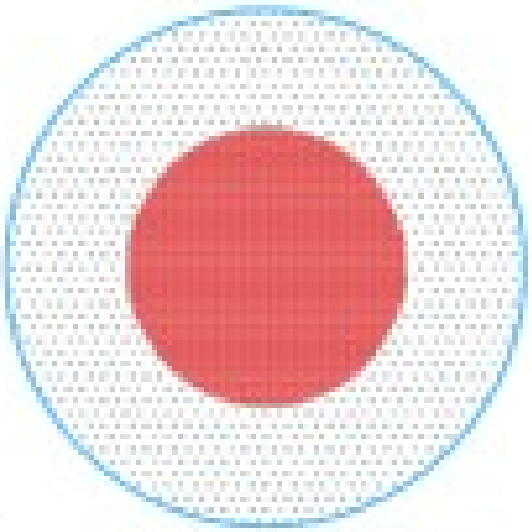




- Double layer cilindrical tank with RPC

- A1 array layout as reference.

- We will focus on the inner array R=160m

SWGO Framework with RPC

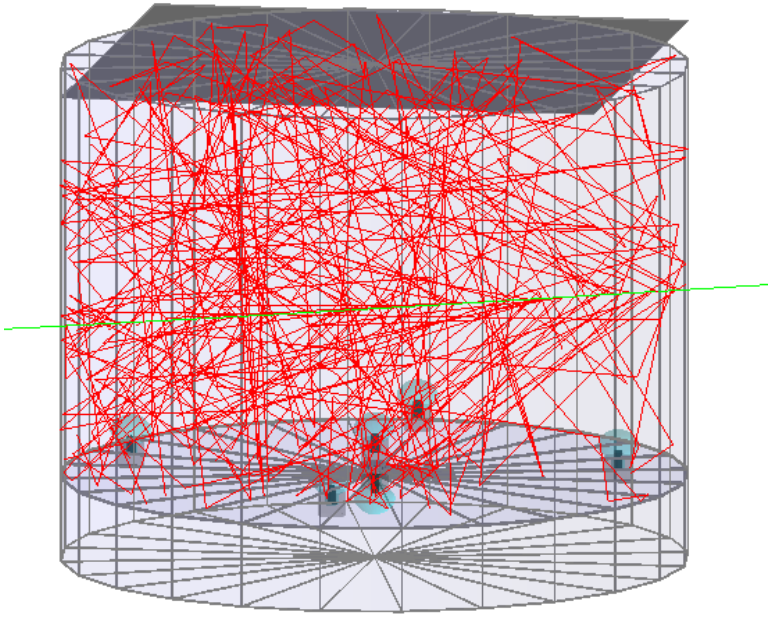
CORSIKA SIMULATIONS:

(http://swgo.umd.edu/)

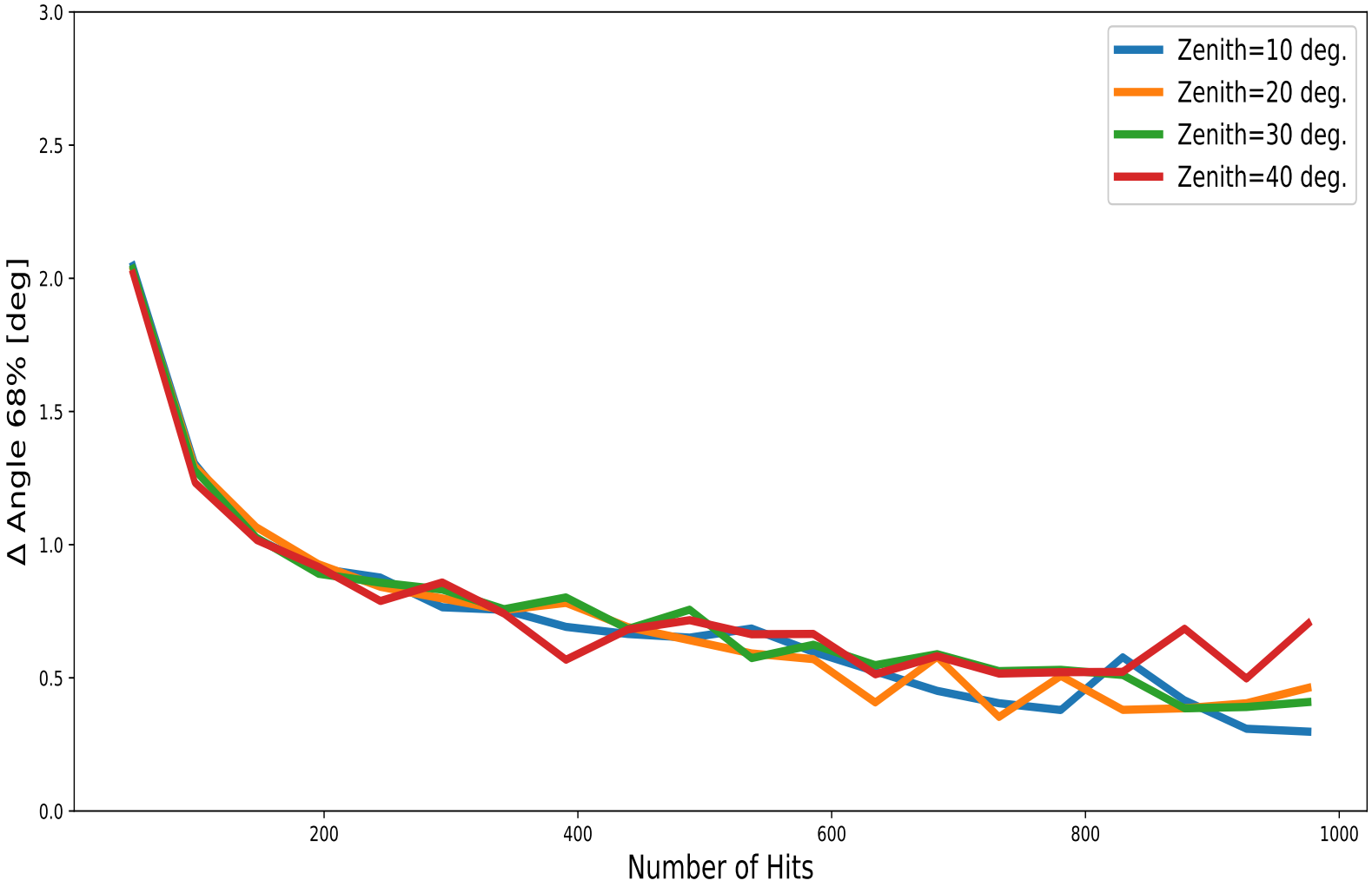
Gamma → powerlaw with 5e7 events
Proton → powerlaw with 5e7 events

Gamma & Protons at fixed energy and zenith 20 deg.

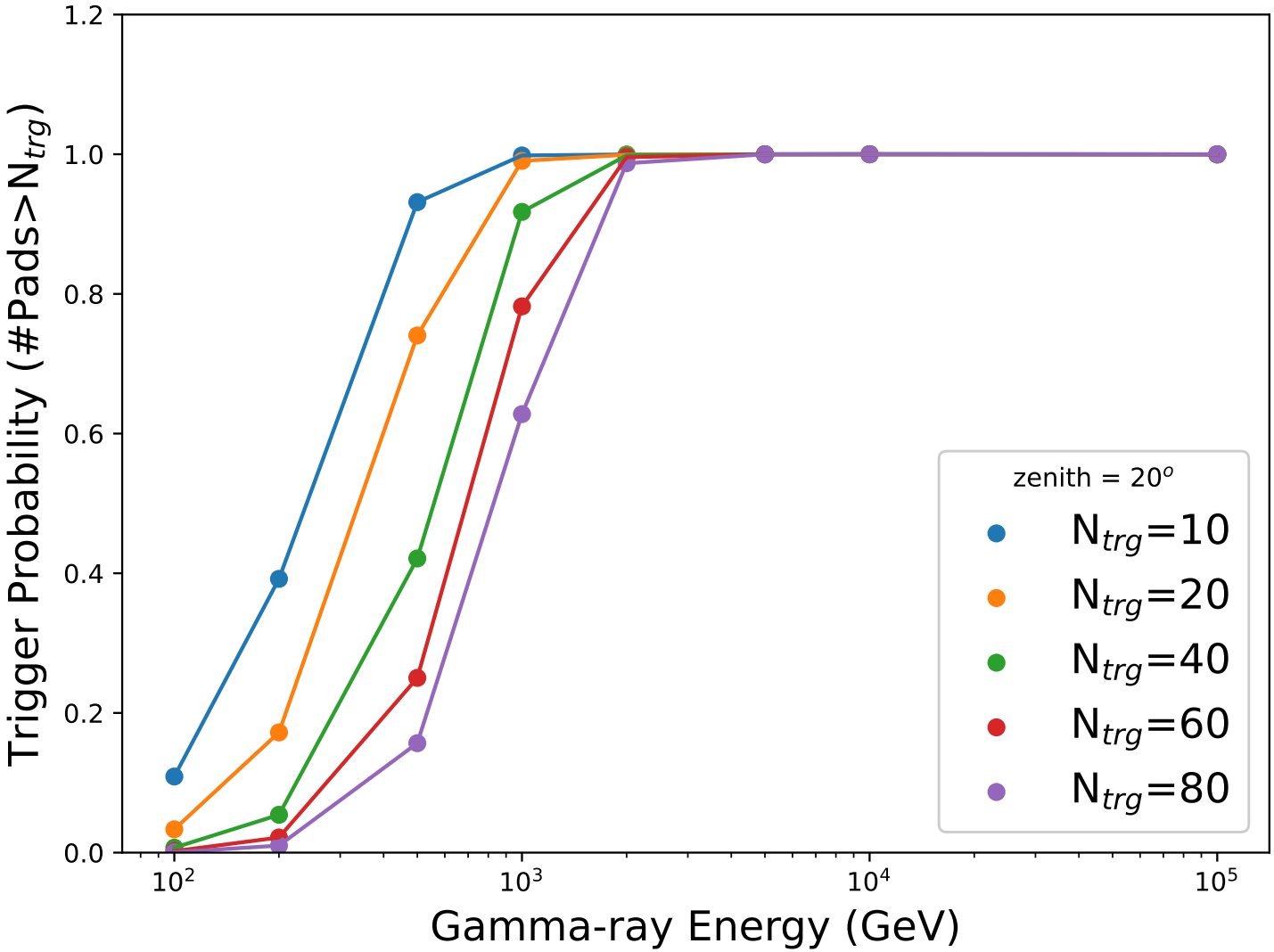
100 GeV → 500K
200 GeV → 500K
500 GeV → 50K
1 TeV → 50K
2 TeV → 50K
5 TeV → 50K
10 TeV → 50K
100 TeV → 50K



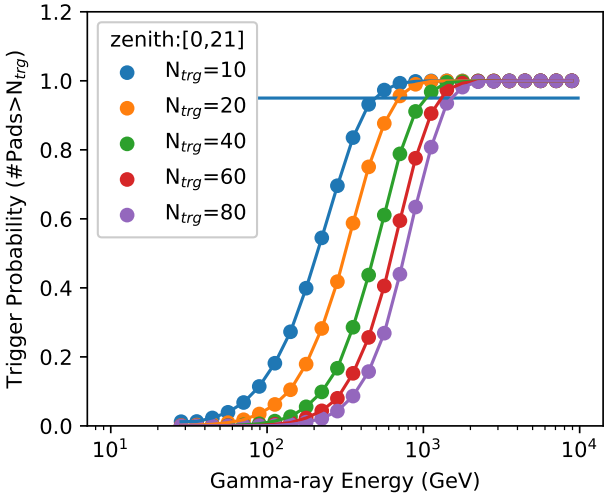
RPC Angular Reconstruction:
Plane fit + curve Fit

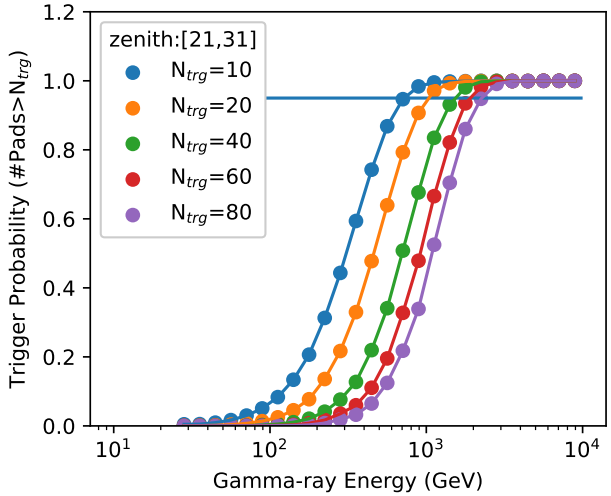


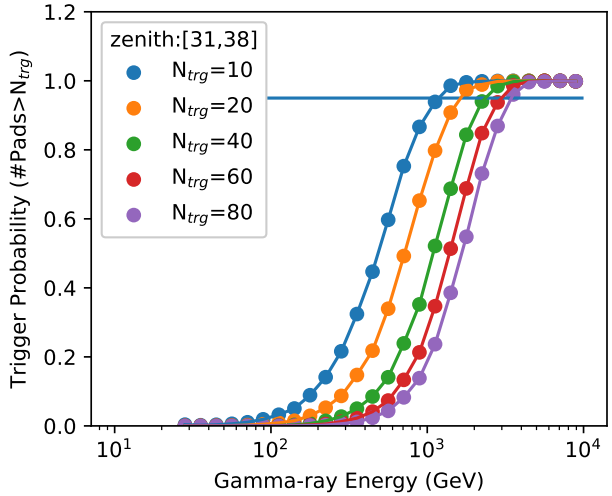
Trigger probabilty
Events with Fixed Energy

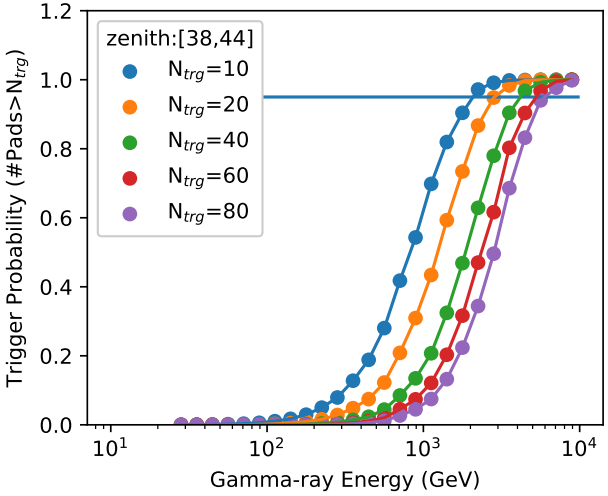


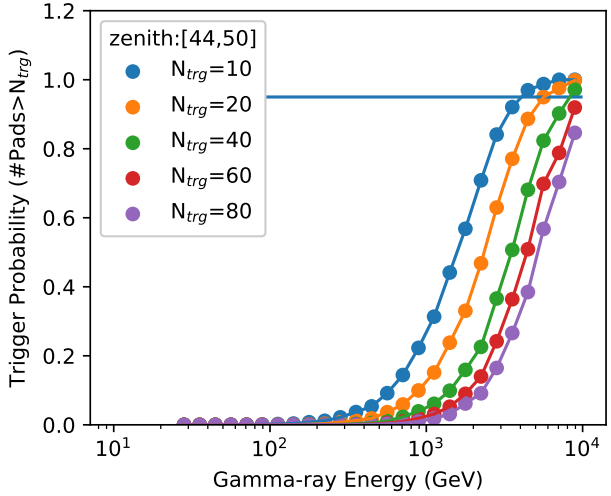
Trigger probabilty
Spectrum events





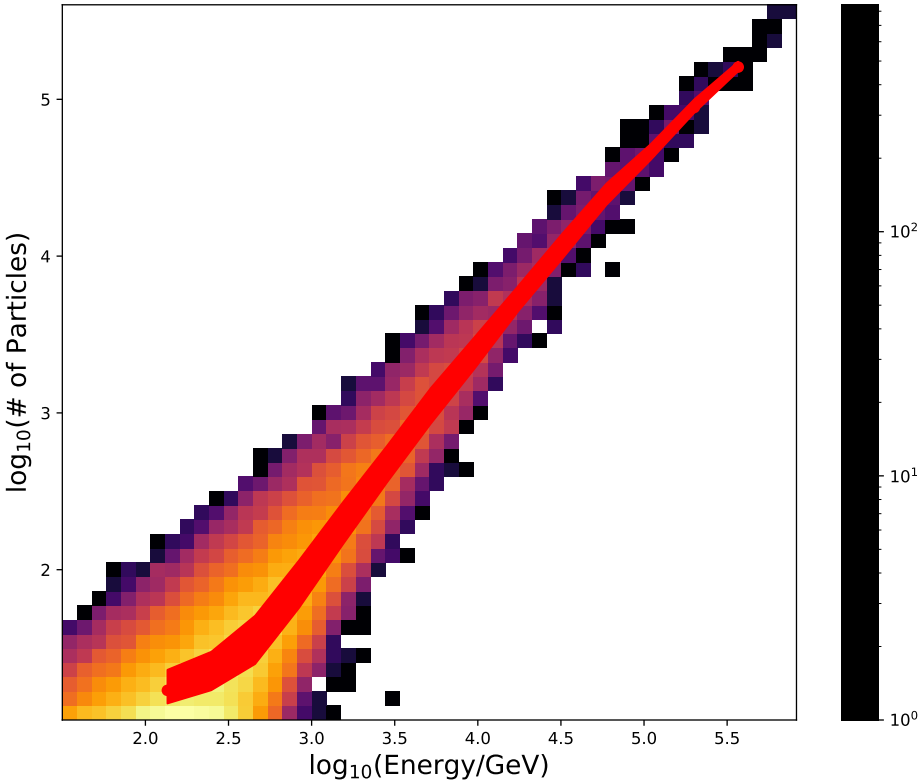


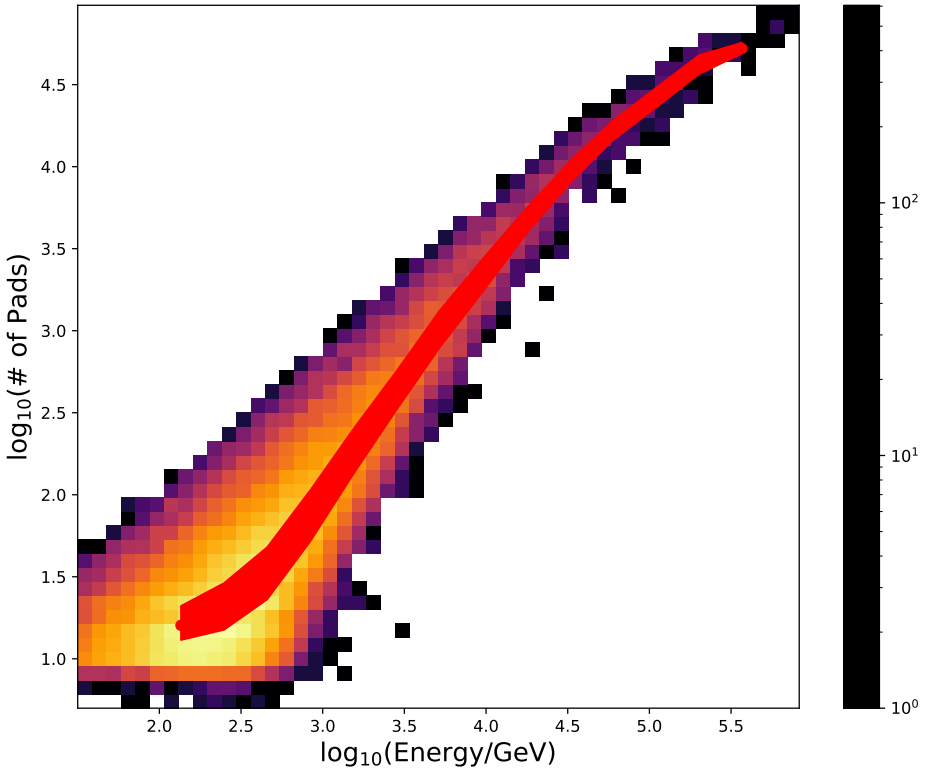




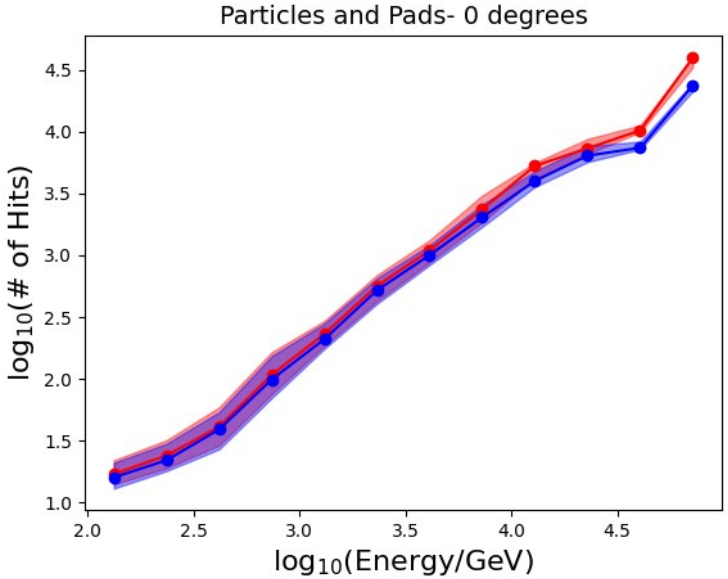
Saturation Effect

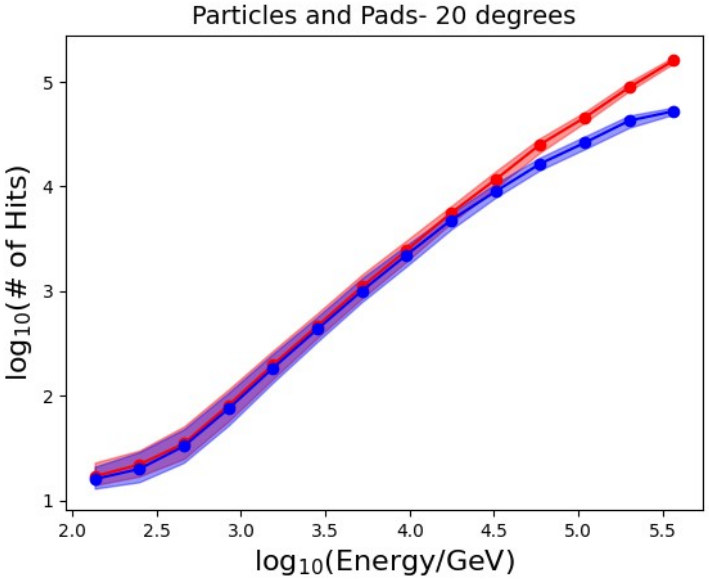
zenith=20deg

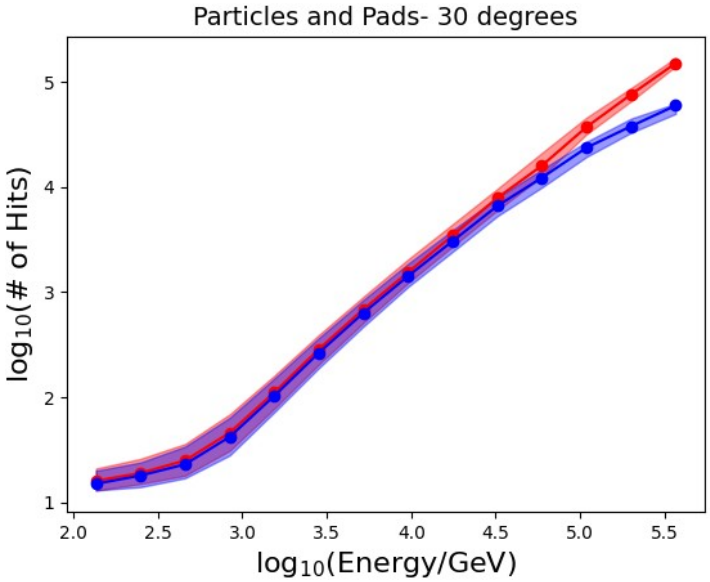


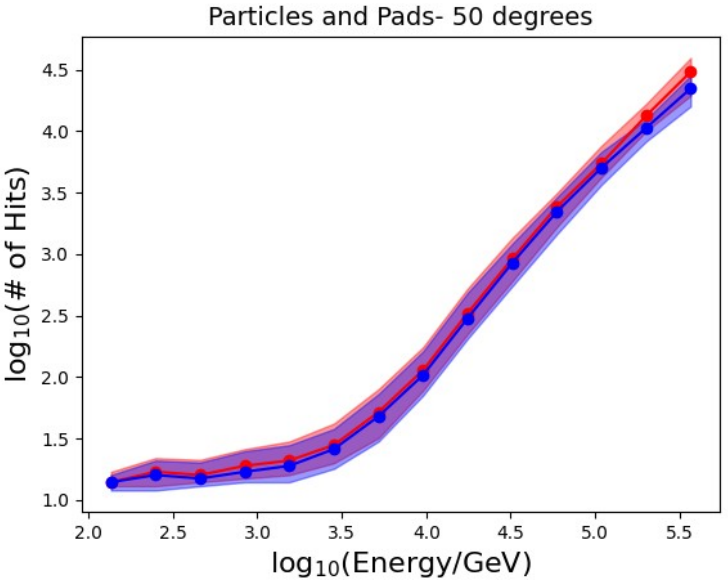


Saturation Effect

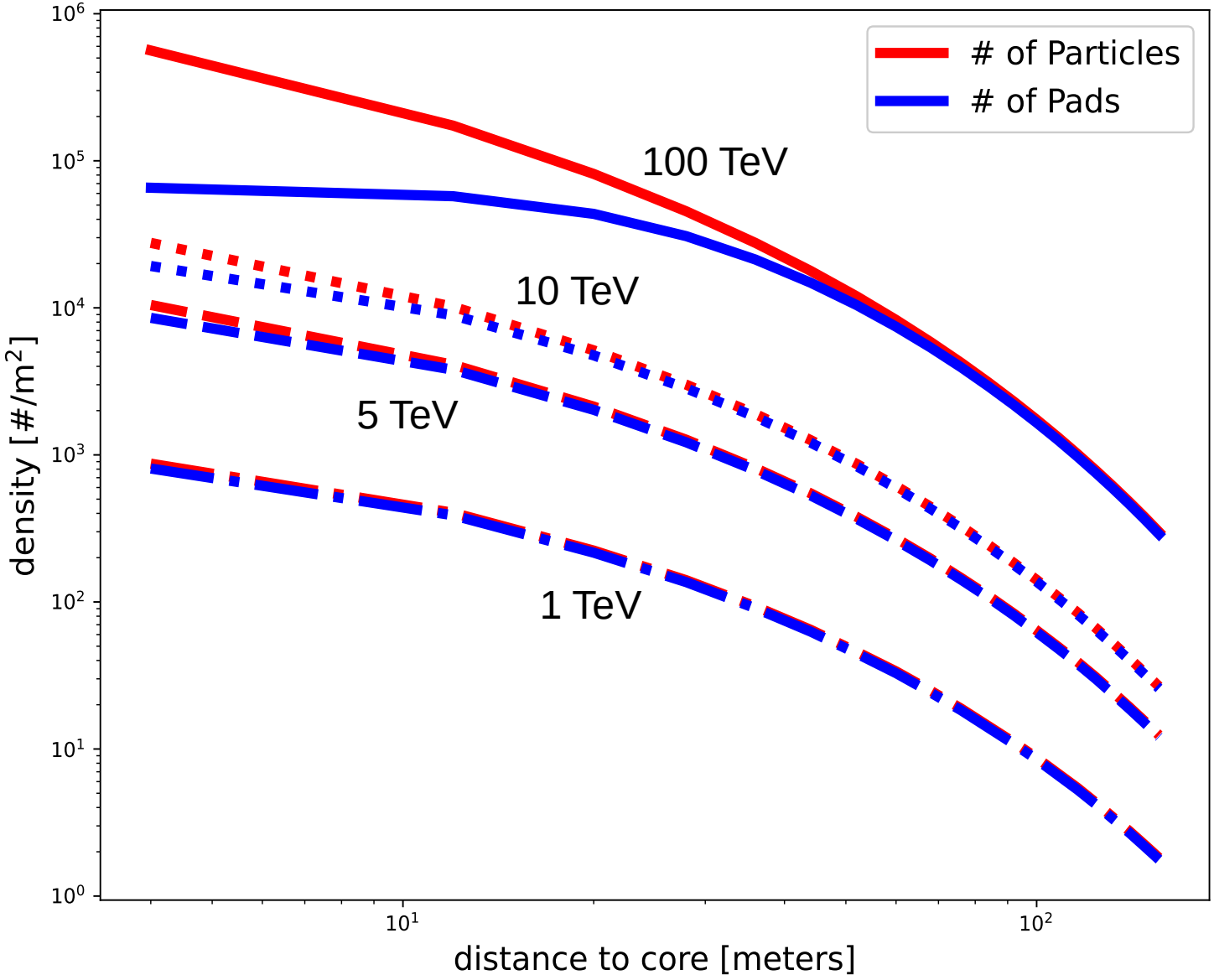








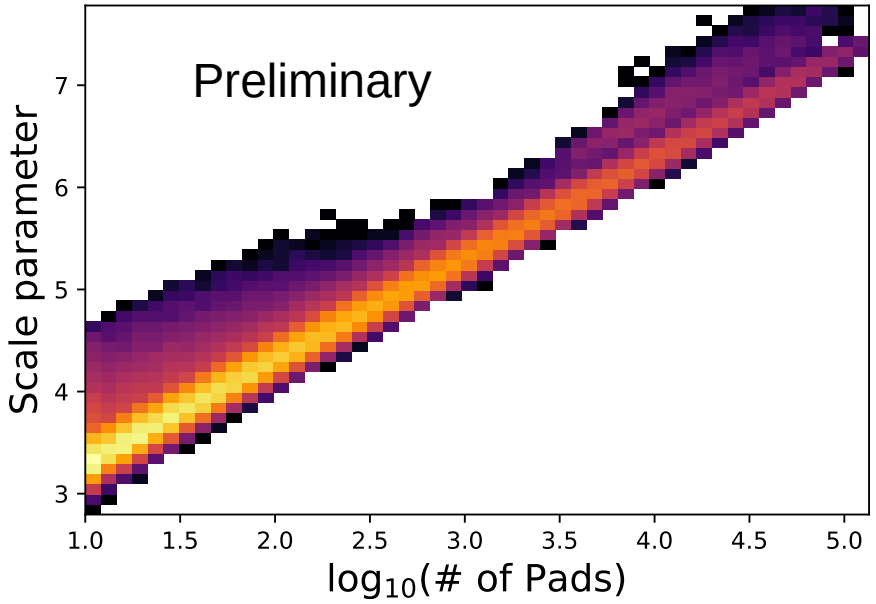
Saturation Effect on the LDF

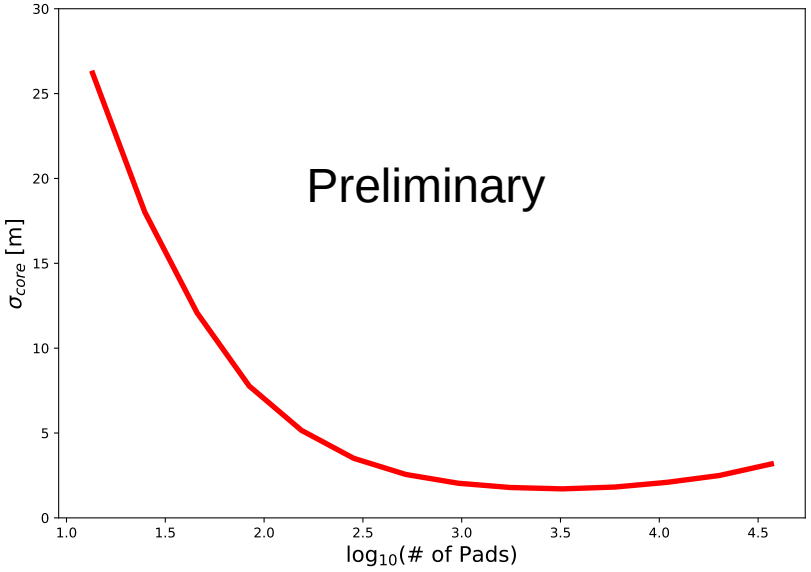


LDF reconstrution

$$\rho(r) = N_e \cdot \frac{f(s, r/r_M)}{r_M^2}$$

$$f(r/r_M, s) = C(s) \cdot (\frac{r}{r_M})^{s-2} \cdot (\frac{r}{r_M} + 1)^{s-4.5}$$

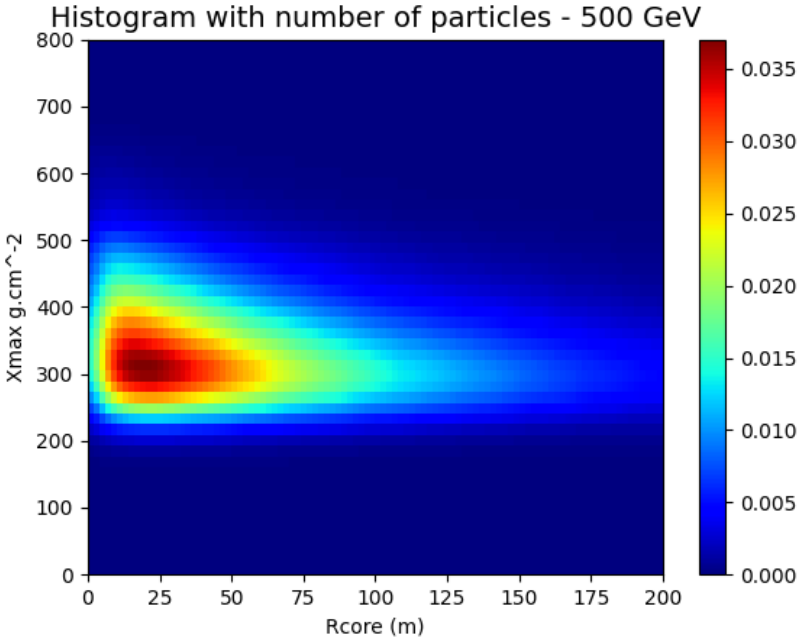


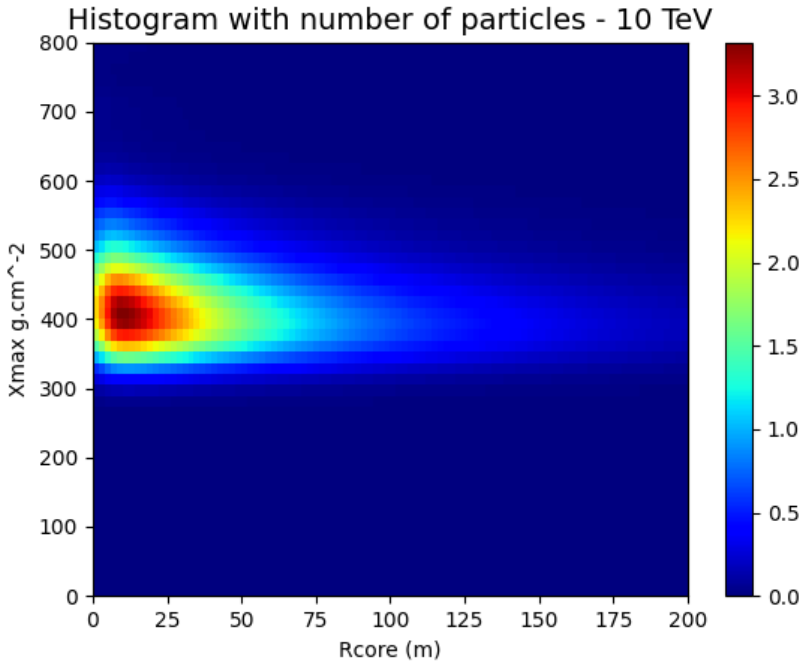


TO BE DONE → study quality cuts

LDF reconstrution

SWGO - Template method





TO BE IMPLEMENTED!