

# Theoretical and simulation study of gamma initiated particle showers in the atmosphere

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## • Input Values

- Primary energy and type particle ( $E_0$ )
- Observation level of the secondary particles ( $h$ )
- Zenith angle for the primary particle ( $\theta$ )
- Azimuth angle for the primary particle ( $\phi$ )
- Atmospheric model for the simulation



# Results

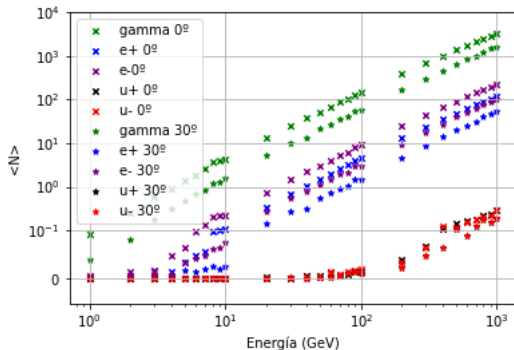
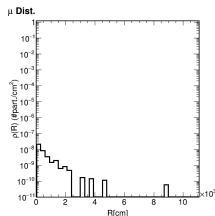
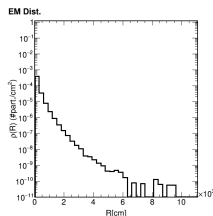
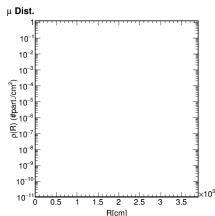
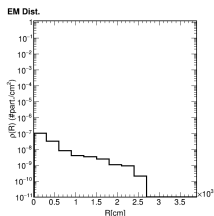


Figure: Mean number of all secondary particles reaching at 4 600 m.a.s.l. vs primary energy for zenith angles  $0^\circ$  ( $\times$ ) and  $30^\circ$  ( $\star$ ).



# Results



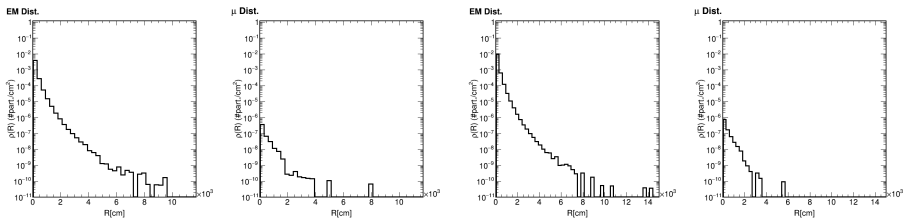
(a) For a primary energy of the photon of 1 GeV.

(b) For a primary energy of the photon of 100 GeV.

Figure: For (a) and (b): Left. Lateral Distribution of the Electromagnetic and Right. Muonic component of the shower.



# Results



(a) For a primary energy of the photon of 500 GeV.

(b) For a primary energy of the photon of 1 TeV.

**Figure:** For (a) and (b): Left. Lateral Distribution of the Electromagnetic and Right. Muonic component of the shower.



# Thanks!

