Improvised Explosive Devices and cosmic rays

Executive Summary

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What is this contribution about?

We present theoretical results that suggest that cosmic rays can be used to detect the type of anti-personal mines used in Colombia.

Why is it relevant/interesting?

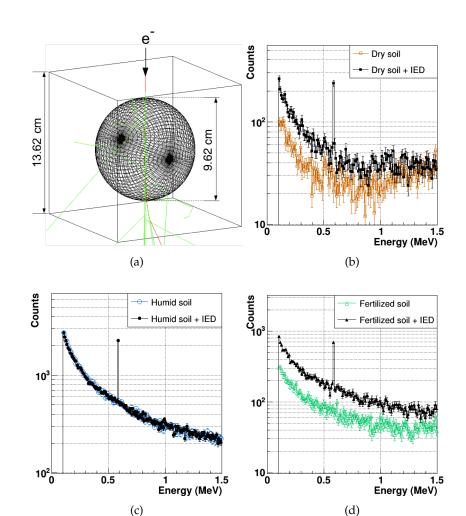
- Homemade anti-personnel mines are Improvised Explosive Devices (IEDs) that kill thousands of civilians every year, spreading fear and disruption across affected communities.
- The detection and dismantling of such harmful devices must alleviate the consequences of the internal conflicts.

What has been done?

- GEANT4 simulation of an ANFO sphere of NH4NO3+diesel, a typical IED found in Colombia, interacting with cosmic rays flux at the Bucaramanga level (959 m a.s.l.) as shown in fig. (a).
- Simulations considered IEDs buried into different soil types: dry soil model, two humid soils, and two fertilized soils.

What is the result?

- Protons' energy led to an excess of around 0.58 MeV.
- This peak is quite pronounced for all soil models (fig. (b), (c) and (d)), giving a clear indication of the feasibility of using a cosmic ray-based detector for detecting these type of rustic explosive in the different types of soils.



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