

Parameterization of Muon Production Profiles in the Atmosphere

Stef Verpoest and Thomas K. Gaisser

What is this contribution about?

- ❖ A parameterization describing the production profiles of high-energy muons in cosmic-ray air showers.

Why is it relevant/interesting?

- ❖ Production of high-energy muons is relevant for the understanding of muon bundles and event rates in underground detectors.

What have we done?

- ❖ A physically-motivated formula including a dependence on atmospheric temperature is fitted to air shower simulations.
- ❖ The results are parameterized to be used in further calculations, e.g. determining muon bundle properties.

What is the result?

- ❖ A parameterization of muon production profiles as a function of primary energy, mass, zenith, and atmospheric temperature.
- ❖ The parameterization allows one to calculate muon bundle properties, event rates, and their seasonal variations.