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Muon Energy Spectrum From The Analysis of Inclined Shower Footprint

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There is a discrepancy between the number of muons detected in the Pierre Auger observatory detectors and the ones obtained by air shower simulations. In this work, the GEANT4 simulation code is used to analyse footprints of inclined showers starting from basic simulations without realistic parameters and imposing each parameter one by one in order to better study where the simulations fail to describe the number of muons detected. It is intended to develop an experimental method for evaluating the shower muon energy spectrum taking into account the distortions in the shower footprint caused by the Earth's magnetic field in inclined showers. With access to the shower muon energy spectrum, there is hope to get a better understanding about the interactions in between the development of the shower and possibly find a solution to the mismatch in the number of muons.

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