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Lateral Distribution Functions for the Energy Estimation of UHECR Protons

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Abstract content

The energy is among the characteristics of Ultra High Energy Cosmic Rays (E>5 x 1019 eV) which could be estimated experimentally. The following paper attempts to estimate the energy of an UHECR proton by applying a Monte Carlo simulation code. A number of extensive air showers, vertical and inclined, is simulated to derive the Lateral Distribution Functions of the shower muons. The scenario of simulations is adopted to the Cerenkov surface detector of the P. AUGER Observatory. Due to the fact that the Lateral Distribution Functions show minimal fluctuations of the muon density at a distance larger than 800 m from the core of the showers, and due to the fact that at a distance of 900 m the distribution functions for inclined showers coincide (which means that it does not change with the zenith angle of the showers), we select the muon density at 900 m to derive the energy of the primary protons.

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If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 4 (HE part 1), pages 539-542

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