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Identifiability of UHE Gamma-ray Air Showers by Neural-Network-Analysis

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Abstract content

The chemical composition of Ultra-High-Energy (UHE) comic rays is one of unsolved mysteries, and its study will give us fruitful information on the origin and acceleration mechanism of UHE cosmic rays. Especially, a detection of UHE gamma-rays by hybrid experiments, such as AUGER and TA, will be a key to solve these questions. The characteristics of UHE gamma-ray showers have been studied on lateral and longitudinal structure of shower particles by AIRES and our own simulation code, so far. There are apparent differences in a slope of lateral distribution (Eta) and a depth of shower maximum (Xmax) between gamma-ray and proton induced showers because UHE gamma-ray showers are affected by the LPM effect and the geomagnetic cascading process in an energy region of > $10^{19.5eV}$. Different features between gamma-ray and proton showers are pointed out from the simulation study and an identifiability of gamma-ray showers from proton ones is also discussed by the method of Neural-Network-Analysis.

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 563-566

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