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Influence of the scattered Cherenkov light on the width of shower images as measured in the EAS fluorescence experiments

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Abstract content

The EAS induced by ultra high energy cosmic rays excite the atmosphere which emits fluorescence light. Images of showers in this light can be registered from large distances, as narrow tracks, the intensity at a given level being proportional to the shower energy deposited there. However, there is also Cherenkov light accompanying the shower which, when scattered sideways, adds to the fluorescence light. We show that the width of the shower image is determined not only by the lateral spread of the shower electrons, but by the lateral distribution of the Cherenkov light, scattered to the observer. We analyse how this effect scales with the shower parameters and those of its development in the atmosphere. In particular, the importance of this effect grows with the distance (in meters) of the observed shower level to the shower maximum.

If this paper 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 401-404

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