



Contribution ID : 628

Type : **Poster**

Influence of the multiple scattering of light on shower images in UHE fluorescence experiments

Wednesday, 4 July 2007 14:45 (0:00)

Abstract content

The paper concerns the images in the fluorescence light of EAS of ultra-high energies. The effect of the multiple scattering of the light in the atmosphere on the way from the shower to the observer is investigated. We show what are the relevant parameters of the geometry for describing this effect. We also show that when analysing the scattered light not delayed too much (with respect to the non-scattered light) the inhomogeneity of the atmosphere can be taken into account quite easily. The calculations are partly analytical, partly numerical, so that some scaling of the effect can be deduced. This is possible when treating the scattered light as a summ of consequent generations (light scattered only once is the first generation, twice - the second, and so on.) The results show that the main contribution to the scattered light gives the first generation (at least for the experimental conditions such as in the Pierre Auger Observatory.) These considerations are necessary then reconstructing shower parameters from the images in the telescopes.

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'Olive, 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 393-396

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Session Classification : Posters 1 + Coffee

Track Classification : HE.1.4.A