



Contribution ID : 549

Type : **Poster**

Variation of the shower lateral spread with air temperature at the ground

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

Abstract content

The vertical profile of air density at a given site varies considerably with time. Well understood seasonal differences are present, but sizeable effects on shorter time scales, like day to night or day to day variations, are also observed. In consequence, the Moliere radius changes, influencing the lateral distribution of particles in the air showers and therefore may influence the shower detection in surface detector arrays. In air shower reconstruction, usually seasonal average profiles of the atmosphere are used, because local daily measurements of the profile are rarely available. Therefore, the daily fluctuations of the atmosphere are not accounted for. This simplification increases the inaccuracies of shower reconstruction. We show that a universal correlation exists between the ground temperature and the shape of the atmospheric profile, up to altitudes of several kilometers, hence providing a method to reduce inaccuracies in shower reconstruction due to weather variation.

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 369-372

Primary author(s) : Dr. WILCZYNSKA, Barbara (Institute of Nuclear Physics PAN, Krakow, Poland)

Co-author(s) : ENGEL, Ralph (Forschungszentrum Karlsruhe, Germany); HOMOLA, Piotr (Institute of Nuclear Physics PAN, Krakow, Poland); KEILHAUER, Bianca (Universitaet Karlsruhe, Germany); KLAGES, Hans (Forschungszentrum Karlsruhe, Germany); PEKALA, Jan (Institute of Nuclear Physics PAN, Krakow, Poland); WILCZYNSKI, Henryk (Institute of Nuclear Physics PAN, Krakow, Poland)

Presenter(s) : Dr. WILCZYNSKA, Barbara (Institute of Nuclear Physics PAN, Krakow, Poland)

Session Classification : Posters 1 + Coffee

Track Classification : HE.1.4.A