



Contribution ID : 387

Type : Oral

Air fluorescence yield dependence on atmospheric parameters

Tuesday, 10 July 2007 11:18 (0:12)

Abstract content

The fluorescence detection of ultra high energy ($\sim 10^{18}$ eV) cosmic rays requires a detailed knowledge of the fluorescence light emission from nitrogen molecules, which are excited by the cosmic ray shower particles along their path in the atmosphere. We have made a precise measurement of the fluorescence light spectrum excited by MeV electrons in dry air. We measured the relative intensities of 34 fluorescence lines in the wavelength range from 284 to 429 nm with a high resolution spectrograph. The fluorescence spectrum dependence on pressure, temperature and humidity was also measured. The details and precision of the AIRFLY measurements surpass that of previous experiments and reduce significantly the systematic uncertainty in the determination of the cosmic ray shower energy with the fluorescence technique.

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

AIRFLY 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. 5 (HE part 2), pages 933-936

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Session Classification : HE 1.5

Track Classification : HE.1.5