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Energy dependence of air fluorescence yield

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Abstract content

In the fluorescence detection of ultra high energy ($\gtrsim 10^{18}$ eV) cosmic rays, it is assumed that the number of emitted fluorescence photons is proportional to the energy deposited in air by shower particles. We have performed measurements of the fluorescence yield in atmospheric gases excited by electrons over a wide energy range. AIRFLY has collected data between 1 and 3 MeV at a Van de Graaff electron accelerator, and between 3 and 15 MeV at the AWA LINAC, both located at the Argonne National Laboratory. Fluorescence yield induced by electrons in the range 50 to 500 MeV was studied with an extracted beam at the Beam Test Facility of Laboratori Nazionali di Frascati. The large flux of photons from the APS synchrotron radiation source at the Argonne National Laboratory allowed us to explore the fluorescence emission from keV electrons produced by X-ray interaction in air. Results of these measurements are summarised.

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 937-940

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