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Experimental Emulation of Air Fluorescence and study of its Yield at Low Pressure Electrical Discharges

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Abstract content

Having high-resolution UV spectra produced from EAS fluorescence, one can determine in a more accurate way the effects of atmospheric attenuation of these signals by including Rayleigh, Mie-scattering as well as resonance absorption inside the atmosphere. For this reason, we developed an experimental setup for emulating the air-fluorescence using high-resolution spectroscopy in the UV range from 300 to 400 nm. We used low pressure electrical discharges in air, as light source, and registered the spectra with high resolution spectrometers of 0.25, 1, 2 and 3 m focal lengths. These pressure and temperature conditions, existing in the low pressure lamp used, are far from the ones existing during EAS fluorescence but such data might be useful for better understanding of the fluorescence emission, and also in allowing to adapt such spectrometers in dedicated fluorescence yield experiments in accelerators, since in the relevant literature there are not available data with such high resolution. In addition, there are very few experimental data taking into account the parameter temperature in space and thus we designed a monochromator for measurements of air-fluorescence yield as a function of pressure and temperature, using spectral lamps in which the above parameters can be controlled, which is presented in this work.

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'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 1129-1132

Primary author(s) : Mr. MALTEZOS, Stavros (National Technical University of Athens, Physics Department)

Co-author(s) : Mr. FOKITIS, Emmanuel (National Technical University of Athens, Physics Department); Mr. GERANIOS, Athanasios (Physics Department, Nuclear and Particle Physics Section,

University of Athens); Ms. GIKA, Violeta (National Technical University of Athens, Physics Department)

Presenter(s) : Mr. MALTEZOS, Stavros (National Technical University of Athens, Physics Department)

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