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Experimental Details and Calibration of The FLASH Thin Target Experiment

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Abstract content

The thin target mode of the FLASH (Fluorescence in Air from Showers) experiment was conducted at SLAC. The aim was to measure the total and spectrally resolved fluorescence yield of charged particles traveling through air to better than 10%. The setup consisted of a 15.24 cm thick gas volume which was viewed by two PMT detectors each equipped with 15 remotely interchangeable narrow band filters to measure the fluorescence spectrum between 300 and 445 nm. Final results of the FLASH experiment will be presented in a talk at this conference. The calibration of the experimental setup is crucial in minimizing the systematic uncertainty of the measurement. We will describe how the physics of Rayleigh scattering is used to derive an absolute end-to-end calibration of the experiment from first principles. In addition, a method for a relative calibration is presented using a setup with a mercury lamp, a monochromator and a NIST calibrated photo diode in a light sealed black box. Finally, the toroid measuring the beam charge had to be calibrated. The combination of all three measurement uncertainties provided an absolute calibration of the FLASH experiment.

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

FLASH

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 1133-1136

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