30th International Cosmic Ray Conference

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A Fabry-Perot Interferometer prototype for use in Doppler LIDAR for atmospheric and night sky background monitoring in EAS detection

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Abstract content

A Fabry-Perot interferometer prototype is studied, as part of a Doppler LIDAR (DL) receiver, for determining the aerosol to molecular scattering ratio for use in EAS Fluorescence Detectors. The etalon of this instrument has a Free Spectral Range of 0.1 cm[-1] and resolution in wavenumber 0.04 cm[-1] . Possible additional use of the proposed DL receiver can be as a spectrally selective detector to measure the aerosol phase function normalized to the molecular phase function using a bi-static LIDAR. Both molecular and aerosol data are collected by the same DL receiver simultaneously as opposed to the Rayleigh or Raman LIDAR adopted in the atmospheric monitoring procedures in EAS fluorescence telescopes. We present preliminary laboratory results and evaluate their capabilities to meet the requirements of the above two calibration issues of EAS measurements. The results from the present prototype are expected to lead to a design for a DL receiver aiming to achieve measurements of the aerosol backscattering coefficient with accuracy of the order of 5%, presenting a significant progress in comparison with the present techniques used in atmospheric monitoring for EAS fluorescence or atmospheric Cherenkov telescopes.

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 1137-1140

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