

Use of the Fabry-Perot Interferometer for atmospheric and night sky background monitoring in EAS detection

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The Fabry-Perot interferometry is studied for determining the aerosol to molecular ratio for use in Fluorescence Detectors. This can be realized using an etalon with Free Spectral Range (FSR) of 0.05/cm. Another use of this instrumentation is considered in monitoring some typical spectral lines of the night sky background (NSB), typically the atomic oxygen lines at 557.7 and 630.0 nm, and the line 365 nm of mercury caused by artificial light pollution. The intensities of these lines need to be monitored in order to obtain the optical noise components especially in the UV and red region of the spectrum for EAS detection with the fluorescence or air-Cherenkov technique. An etalon with FSR of 0.25/cm is sufficient for this purpose. The mirror flatnesses of both interferometers used is between $\lambda/150$ and $\lambda/200$. We give the details of a design of a double peak optical filter needed for selecting the above two oxygen lines in order to record them in the same interferogram with minimum disturbance from the other continuum and discrete part of the NSB. We present preliminary laboratory results with these interferometers and evaluate their capabilities to meet the requirements of the above two calibration issues of EAS measurements.