

THE EFFECT OF TURBULENCE ON LIDAR
BACKSCATTERED SIGNAL FLUCTUATIONS

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CO₂ Lidar measurements being subjected to uncertainties caused by strong fluctuations were explained to appear primarily due to speckle effects whereas turbulence was to be negligible.

Spectral cross-correlation measurements performed in the near IR and in the visible ($\lambda_1=1.06\mu\text{m}$ & $\lambda_2=0.56\mu\text{m}$) show that the main contribution to the fluctuation for the above lidar wavelengths originates from the atmospheric turbulence.

The standard deviation of the fluctuative signal was measured for the two wavelengths simultaneously.

A typical curve representing mid summer day changes in the value of σ as a function of time is shown in Fig 1.

The results, indicating the strong dependence on the turbulence, will be analyzed and discussed.

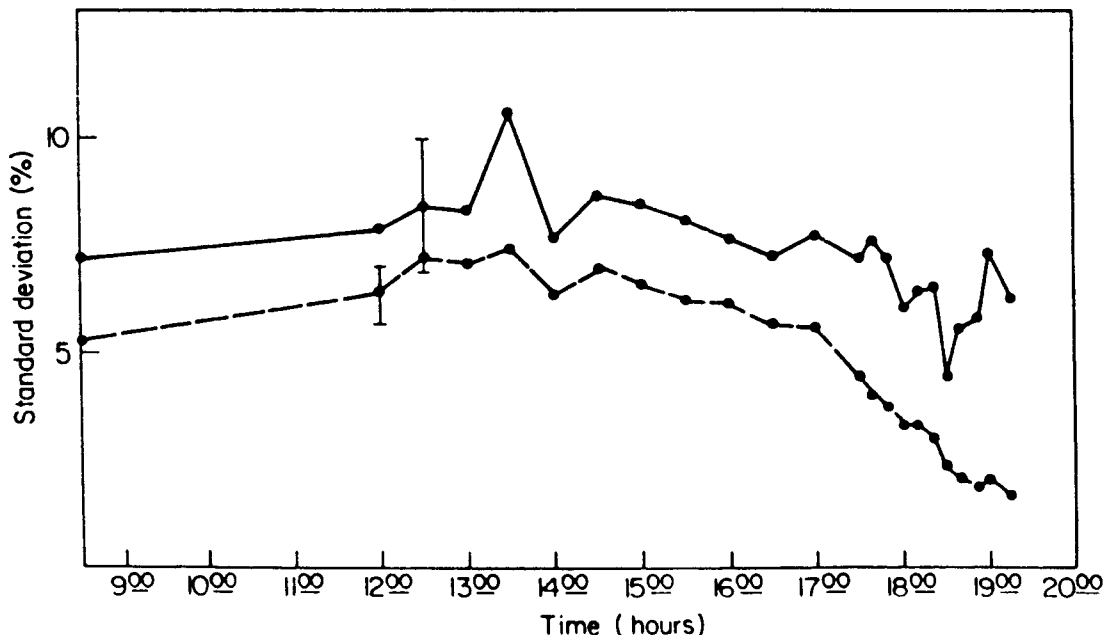


Fig 1: Standard deviation as function of time
(---- 1.06 μm ——— 0.56 μm)