# Analysis of the Correlation Coefficient Between Ceilometer (Backscatter) & TEOM (PM2.5) Measurements To Access the Vertical Density of Aerosols

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## Introduction

- Aerosol: colloid of fine solid particles or liquid droplets in air or another gas
- Anthropogenic aerosols impact climate and human health
- Used two instruments to assess the aerosol concentration, backscattering and their correlation
- Two instruments:
  1. Ceilometer
  2. TEOM

## Instruments

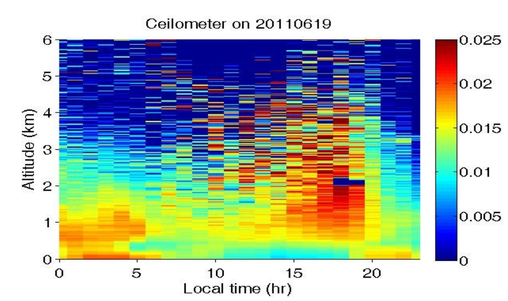
- Ceilometer
- Model CL31
- LIDAR technology
- Backscattering signal
- Cloud base height

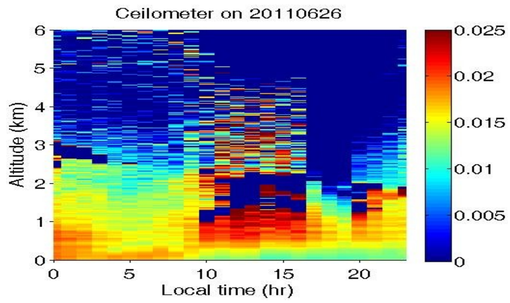
- TEOM® Series 1400a
- Ambient Particulate Monitor
- Air pollution monitoring
- Particulate Matter $PM_{2.5}$µm
- Filtered-base mass measurement

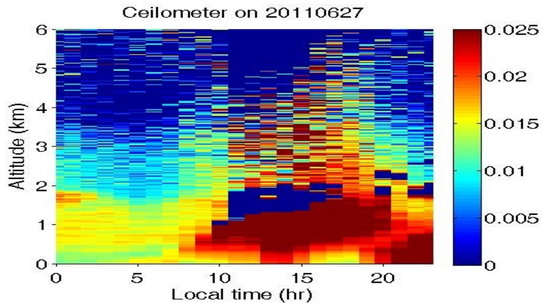
## References

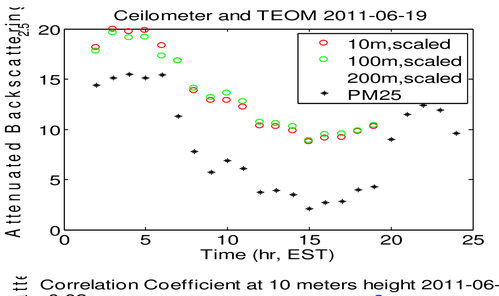

- http://sky.ccny.cuny.edu/wc/Aeronomy/Refs/1400ab_productPDF_27191.pdf
- http://sky.ccny.cuny.edu/wc/Aeronomy/Refs/articlesFile_26544.pdf
- https://www.health.ny.gov/environmental/indoors/air/pmq_a.htm

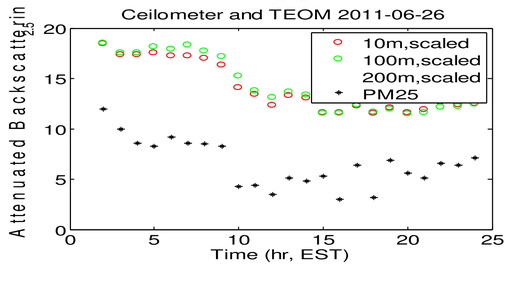

## Results

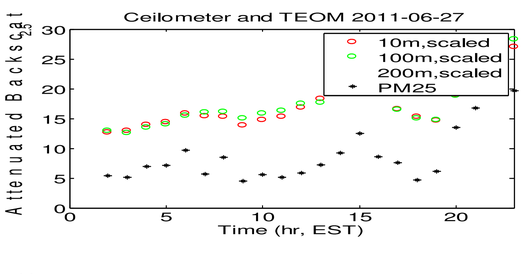


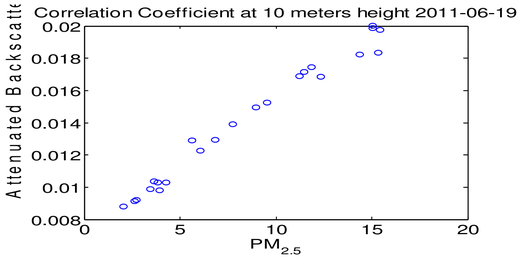



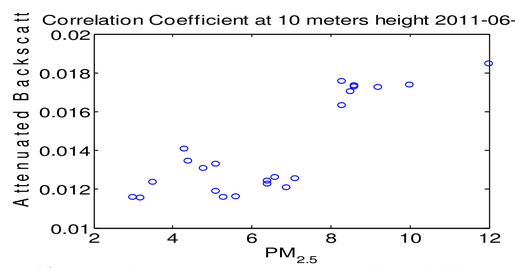



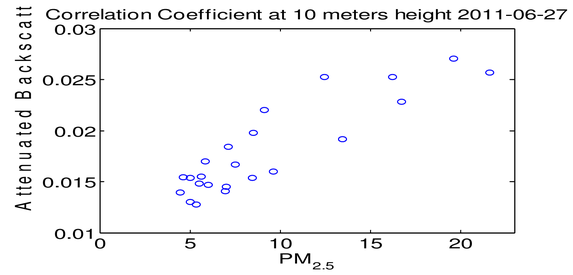



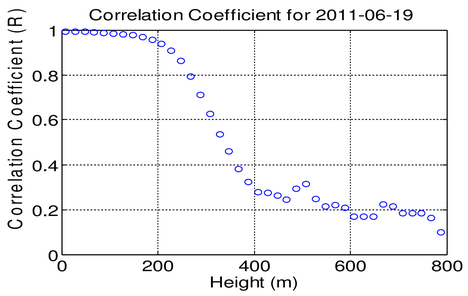



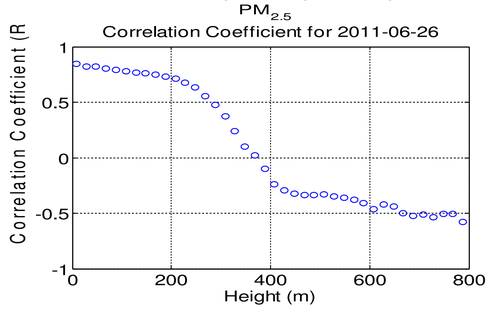



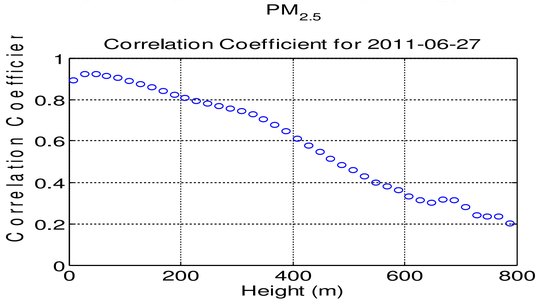




## Method

- Compare two data from Surface to 800 meters
- Determine correlation coefficient with different height

## Conclusion

- Near surface shows high correlation.
- High altitude indicates low correlation.
- Consistency of two instruments at near surface.

## Acknowledgements

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