Light Scattering in Particulate Matter Monitoring as tool for health exposure. Case study: Central Park Cluj-Napoca, Romania

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Introduction

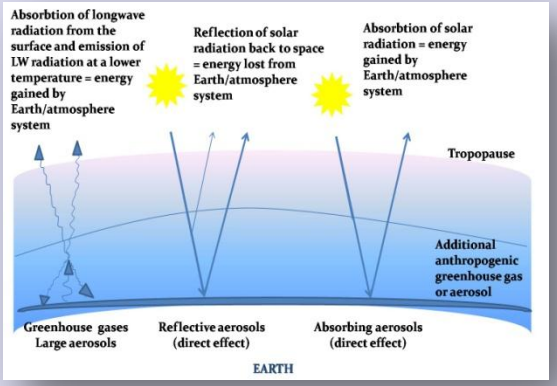
PM - Two perspectives of study

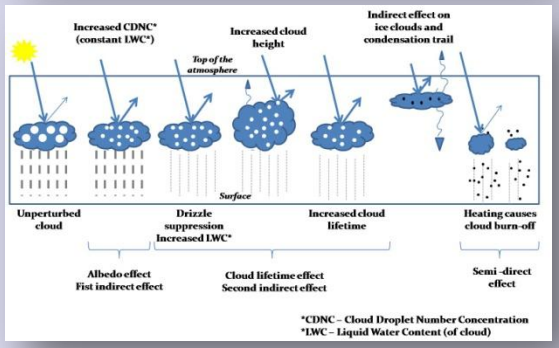
Environmental

Climatic effects

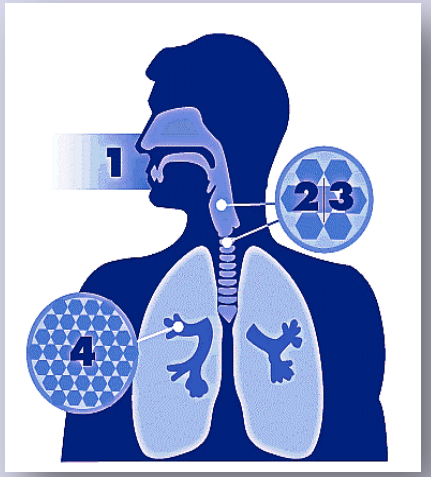
Medical

Health effects



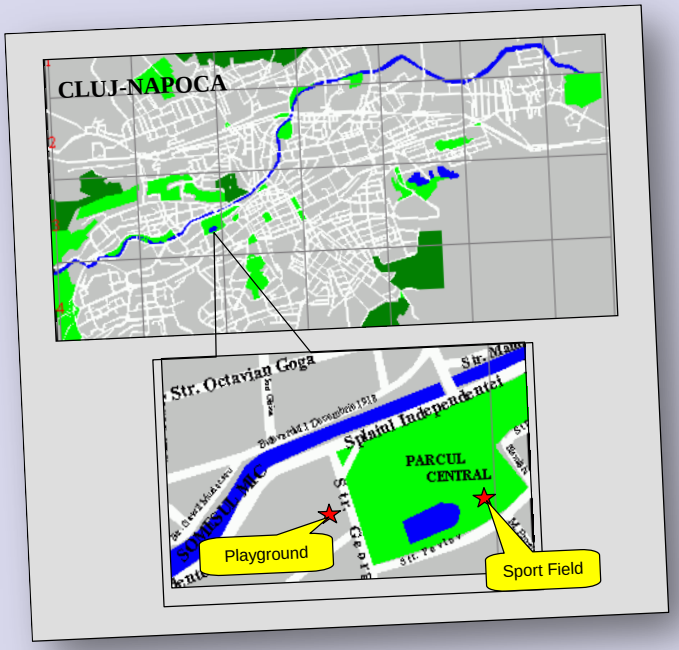


- *lung and heart problems*
- *respiratory diseases*
- *deliver harmful chemicals to the blood*
- contribute to reduction in life expectancy.



!! Children – the most susceptible to PM exposure

Methodology

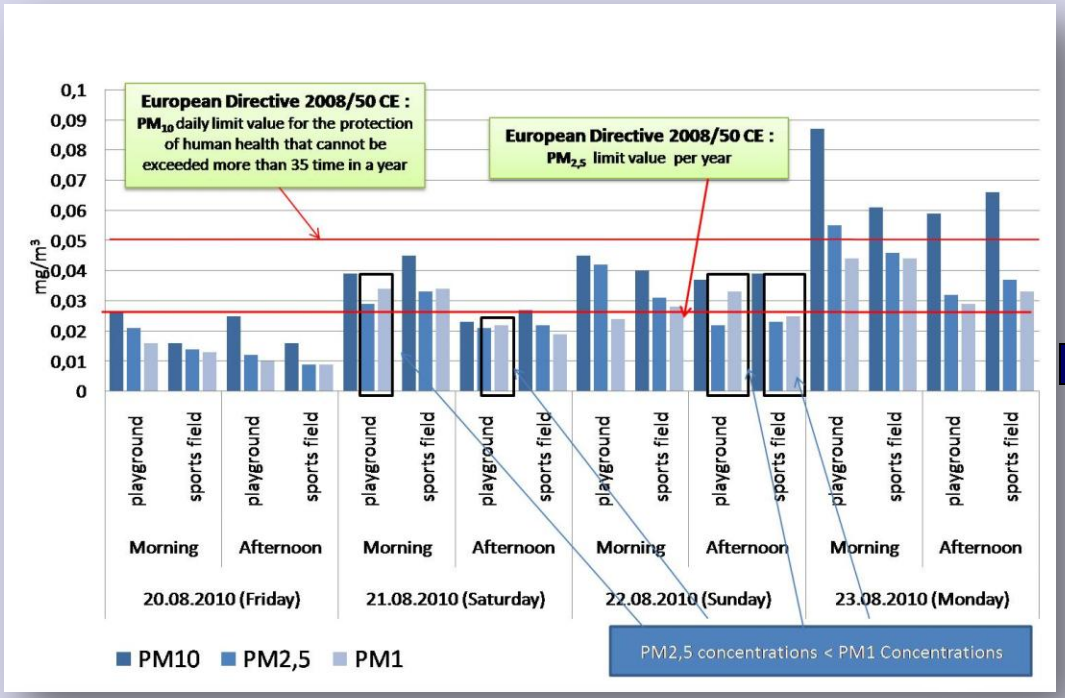


- PM concentration measurements in Cluj-Napoca Central Park
- 4 days PM measurements - 20th - 24th of august
- time intervals: 10 pm -13 pm and 17 pm - 20 pm
- 15 minutes PM_1, $PM_{2,5}$ and PM_{10} averages

Real time PM concentration measurements

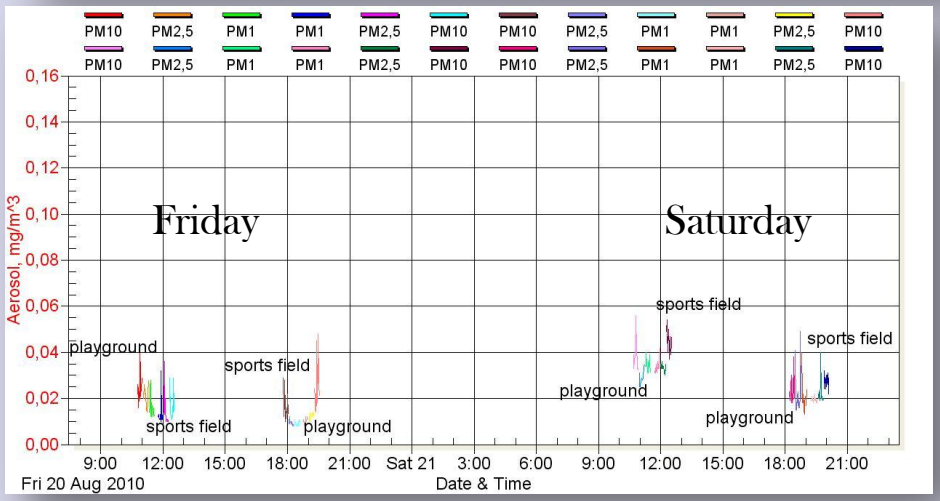
- **DustTrak Aerosol Monitor**
- ***90° light scattering***

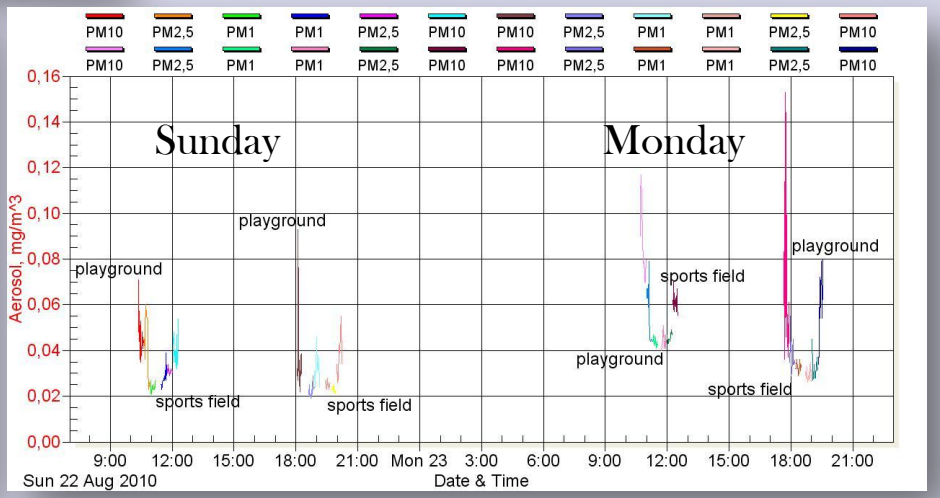
Results and discussions



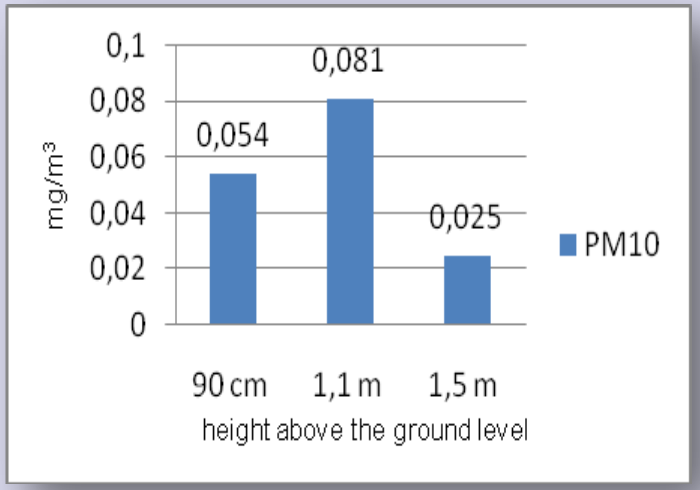
Variable PM concentrations according to:

- Measuring location
- Measuring time
- Sources of emission





Perspectives



- **Long interval monitoring (24 hours) at different heights (90 cm, 1,1 m, 1,5 m) -useful in studies that evaluate PM exposure of vary age groups (children and adults)**

- **Children between 6-11 years are more likely to be exposed at grater PM concentrations**

Conclusions

- Light scattering technique can be successfully used in PM exposure evaluation.
- On the one hand, the study revealed certain differences between the PM concentrations at the two sample locations. On the other hand, there are obvious differences concerning particulate matter concentrations between this location and other urban areas.
- The time dependent graphs given by the TRAKPRO™ Data Analysis Software make the result interpretation much easier helping to distinguish if there are differences between the PM concentration levels in different time intervals.
- PM exposure studies correlated with health effects can be very useful in decision making, in establishing safety limits at which no adverse health effects appear.

Thank you for your attention!