



# Recent occurrence and properties of **atmospheric** suspended particulate material at Prague- Suchdol, Czech Republic

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# Particulate atmospheric matter

- What is it?

- solid particles suspended in atmosphere including **mineral oxides**, **salts**, **biogenic material**, **carbon particles** (soot, coal etc.),

- Where does it come from?

- **natural** sources = forest fires, volcanic eruptions, dust storms etc.

- **anthropogenic** sources = combustion, road transport, construction etc.

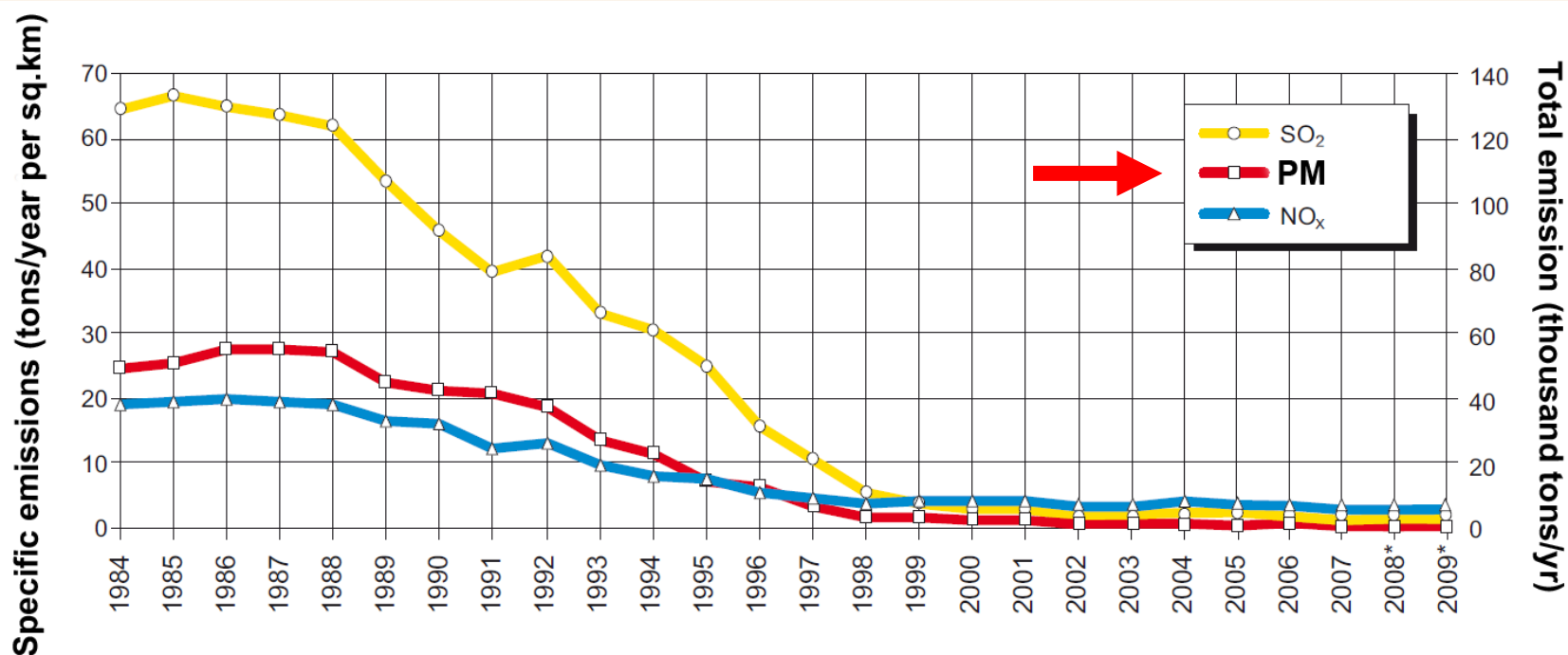
- Why to look at it?

- for those looking at records in **recent sediments**, **peat deposits**, **soils** etc. = your everyday input (or at least a part of the input)



# Particulate emissions - Prague

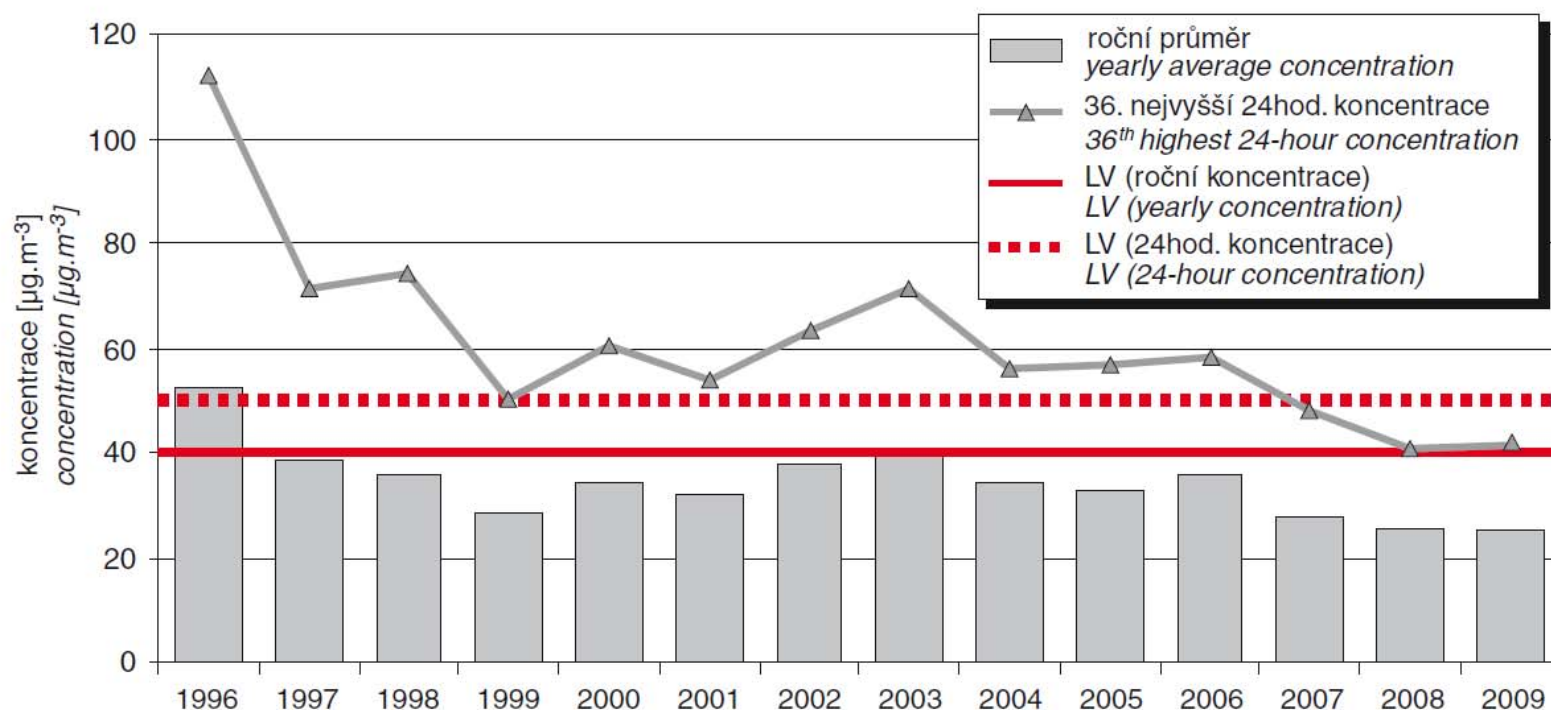
- emissions from stationary sources



- where does it come from now? non-stationary sources...



# Particulate matter - concentration



Zdroj / Source: ČHMÚ

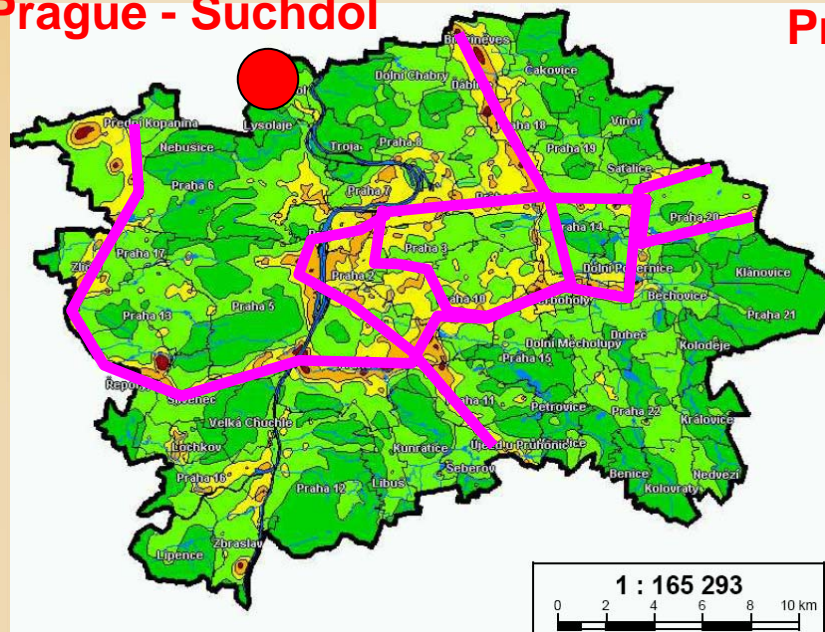
- majority attributed to road transport

Source: Czech Hydrometeorological Institute <http://www.chmi.cz/>

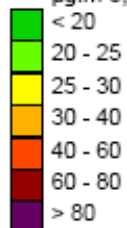


# Prague – model of PM areal distribution

Prague - Suchdol



PM10, průměrné roční koncentrace, imisní limit = 40  $\mu\text{g}\cdot\text{m}^{-3}$ , stav 2010, zdroj ATEM



Prague - Suchdol



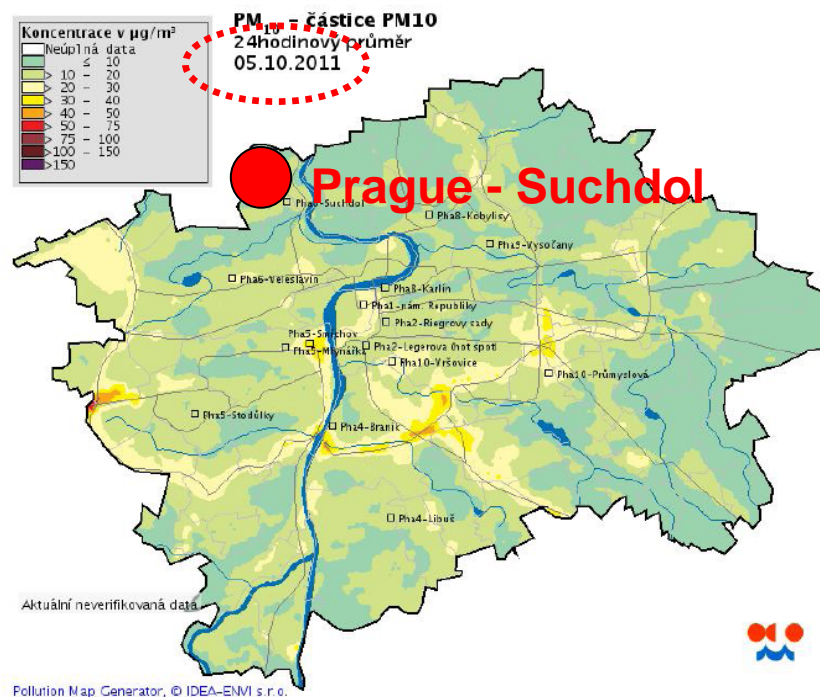
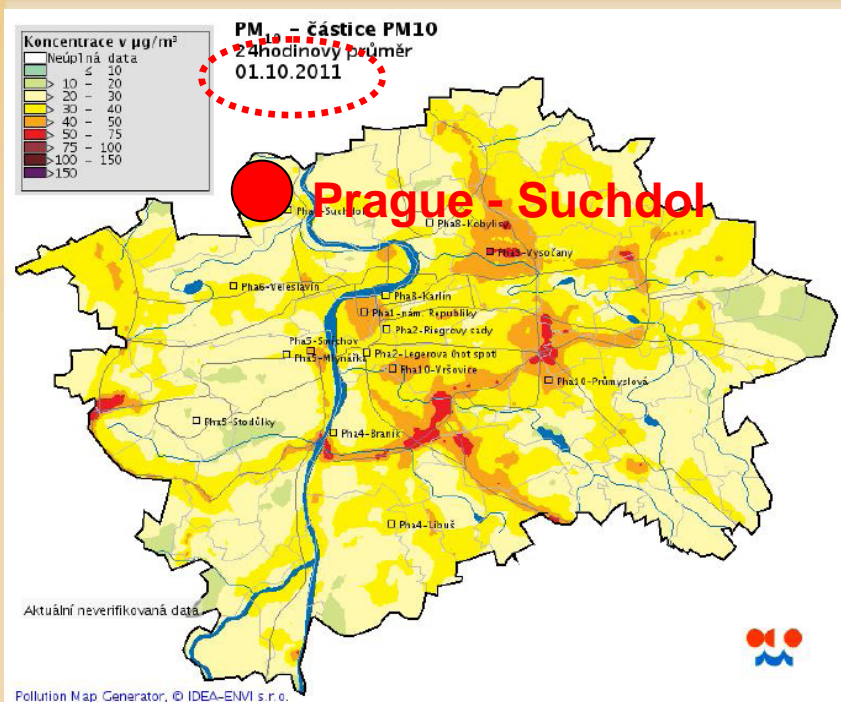
Počet vozidel za den (6 - 22 hod.)







# Prague – PM10 conc. changes





# Suchdol - PM sampling

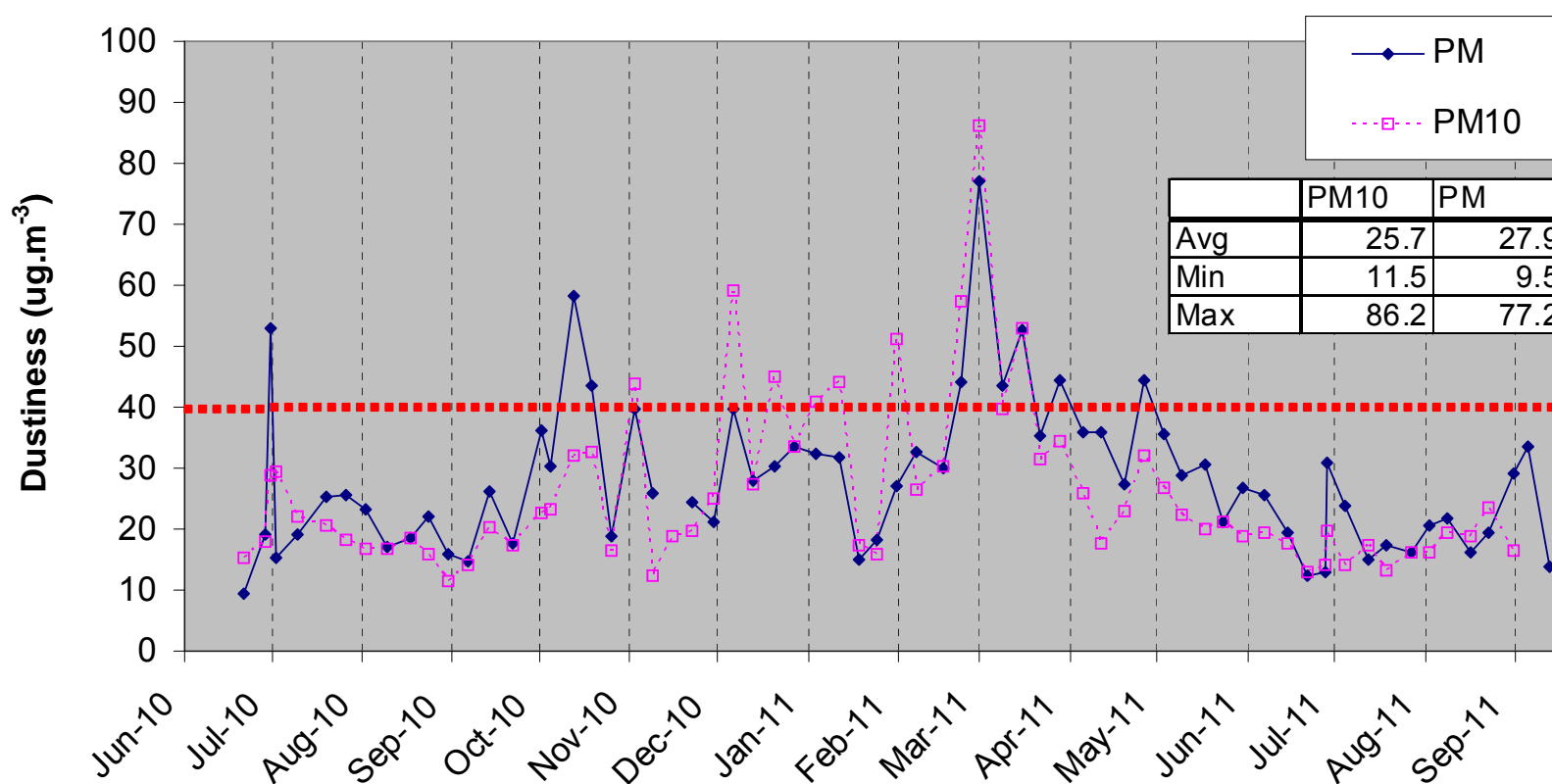


- dry filtration of air
- filters (**glass**, nitrate cellulose, polypropylene)
- weekly time step – to obtain sufficient sample weight
- 2 concurrent samples collected
- range of sample weight 2.3 - 22.4 mg



# Suchdol – weekly PM and PM<sub>10</sub> conc.

- weekly samples (PM - blue) and calculated PM<sub>10</sub> weekly values (red)



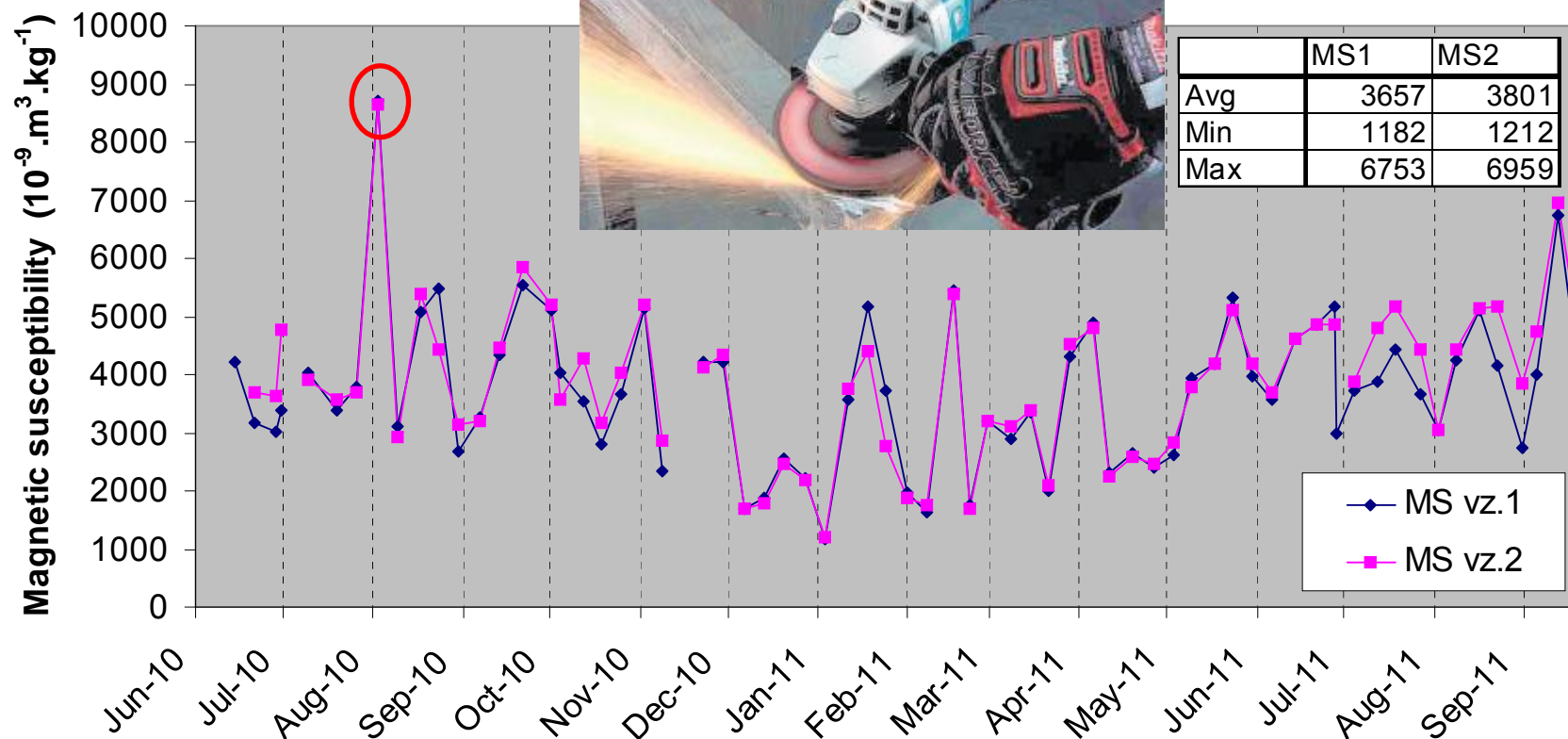
PM<sub>10</sub> data source: Czech Hydrometeorological Institute <http://www.chmi.cz/>





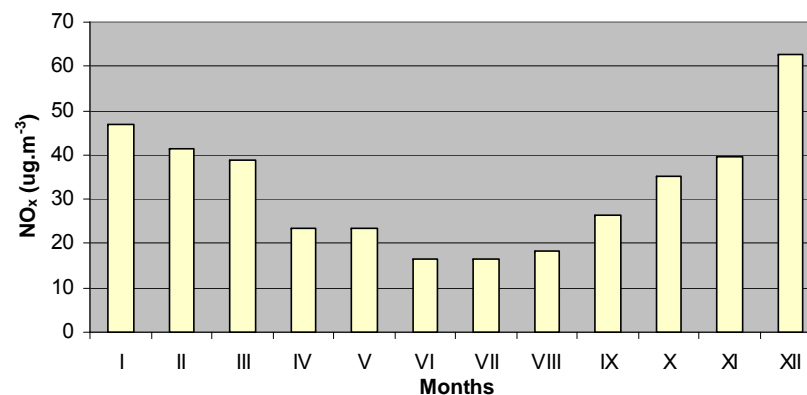
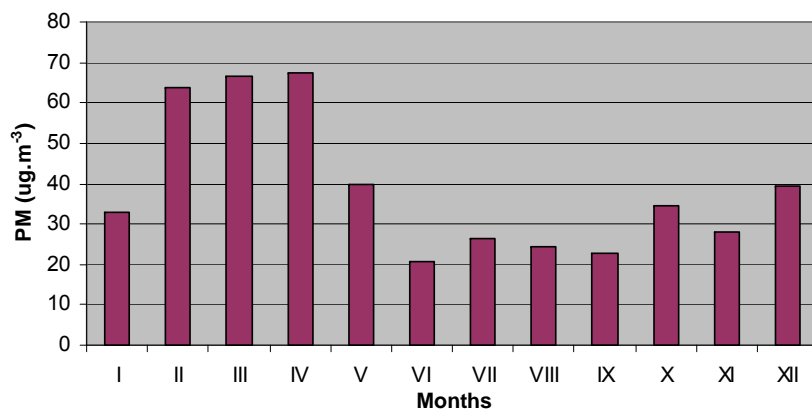
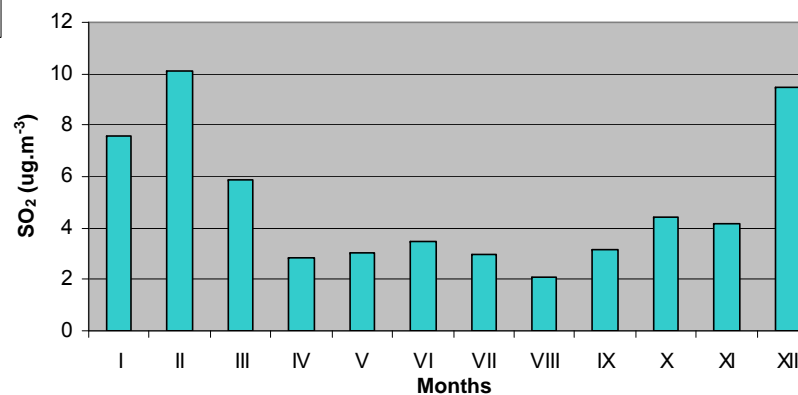
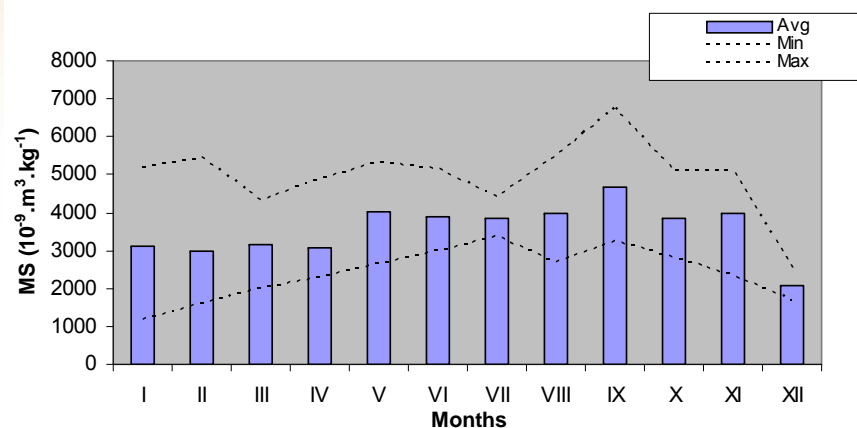
# Suchdol – PM Magnetic Susceptibility

- weekly samples





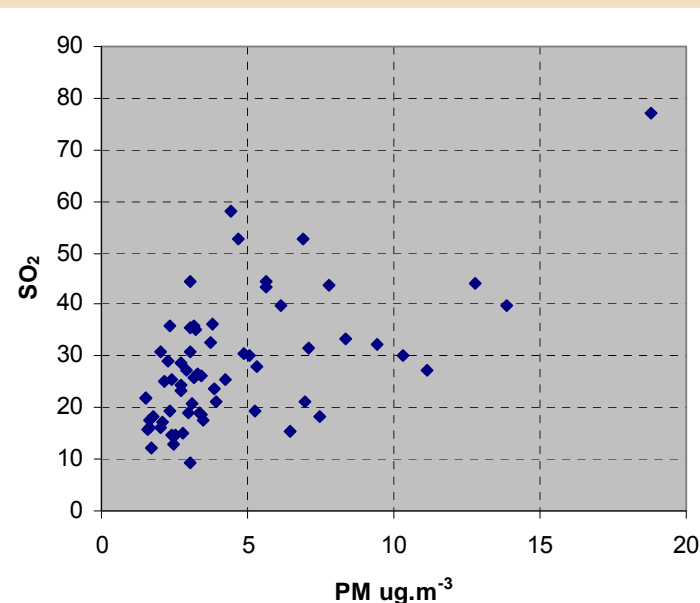
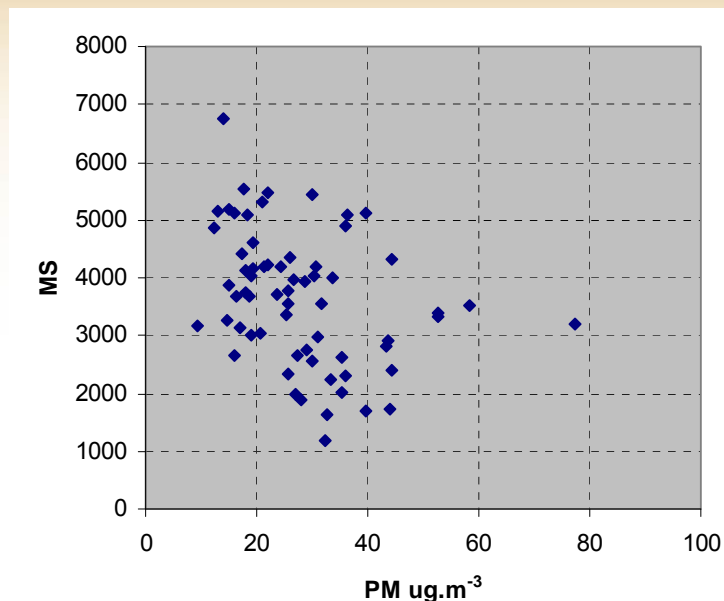
# Suchdol – Monthly Averages



SO<sub>2</sub> and NO<sub>x</sub> data source: Czech Hydrometeorological Institute <http://www.chmi.cz/>



# Suchdol – Monthly Averages



- signal of magnetic particles in Suchdol PM is diluted by non-magnetic material from other source(s) under a specific situations e.g. meteorological conditions (wind direction, temperature inversion etc.)
- association of SO<sub>2</sub> and PM is more typical for stationery sources
- SO<sub>2</sub> and PM accumulate in the atmosphere under similar meteorological conditions



# Conclusions

- MS of urban PM is relatively high
- high MS of particulate matter occurs during low PM concentration periods
- cold months of year – PM with lower MS values

## Further tasks

- check with the meteorological parameters such as temperature and humidity, GLRD, wind direction, wind velocity
- check with data on particle size distribution

