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Concentration levels of atmospheric particles PM10, PM2.5, and PM1 during the winter season on the territory of Novi Sad, Serbia

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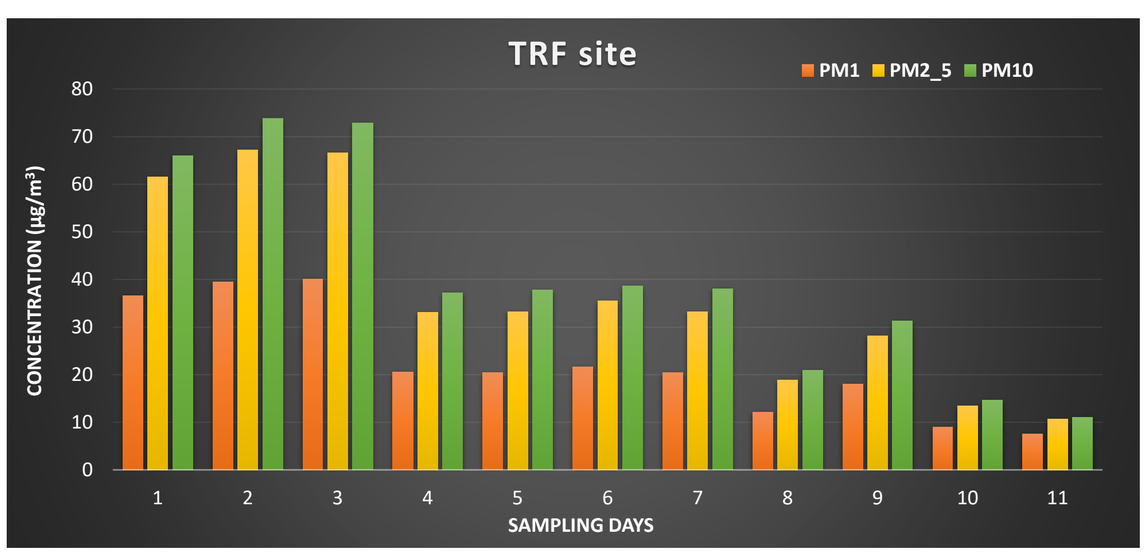
Analysis of ambient air quality in urban, industrial, and individual household areas

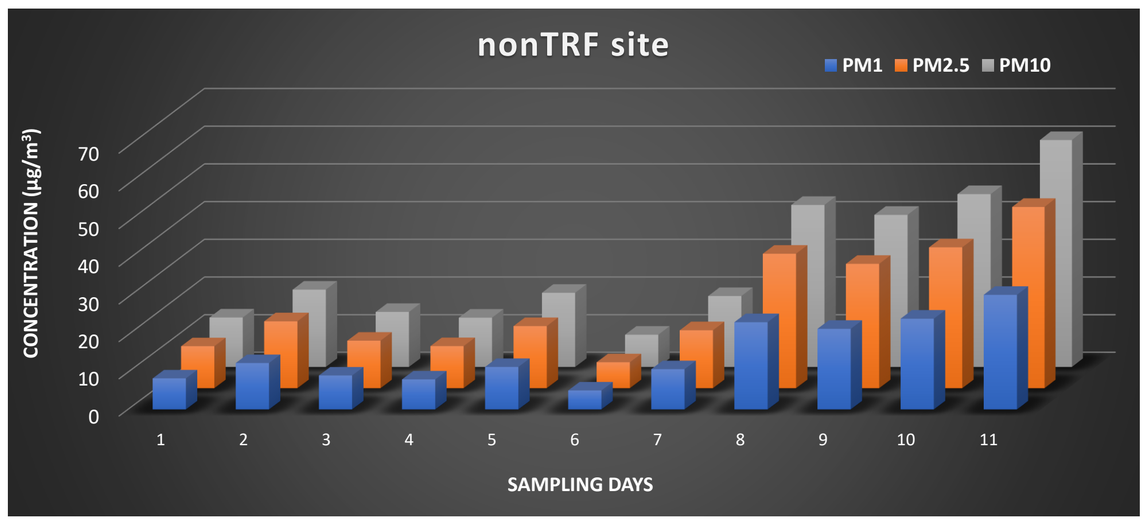
Particulate matter concentrations (PM_{10}, $PM_{2.5}$, and PM_1) were monitored in order to enable further statistical modeling which could potentially lead to the development of high resolution city wide model for particle concentration levels on the territory of Novi Sad.

- Air sampling was conducted within a period of 10 days during February 2020 at 7 locations in the city, using the low-cost sensors (LCS).
- Measuring sites were carefully chosen to represent different scenarios of urban air pollution.
- Five locations were urban, and among them two were with high traffic density (TRF), while 3 measuring sites had smaller direct traffic impact (nonTRF).
- The remaining two locations were individual households (IH), but the second one could also be categorized as industrial one (IND) because it was situated at the very border of the Novi Sad industrial zone.

Measured concentration levels of PM_1, $PM_{2.5}$ and PM_{10} at the urban traffic site

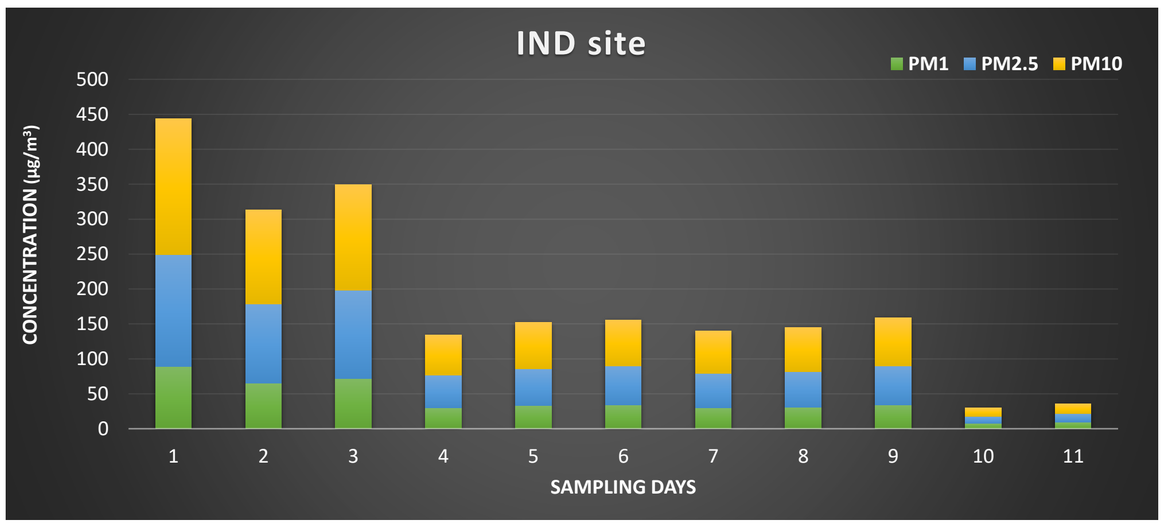


Measured concentration levels of PM_1, $PM_{2.5}$ and PM_{10} at the urban non traffic site

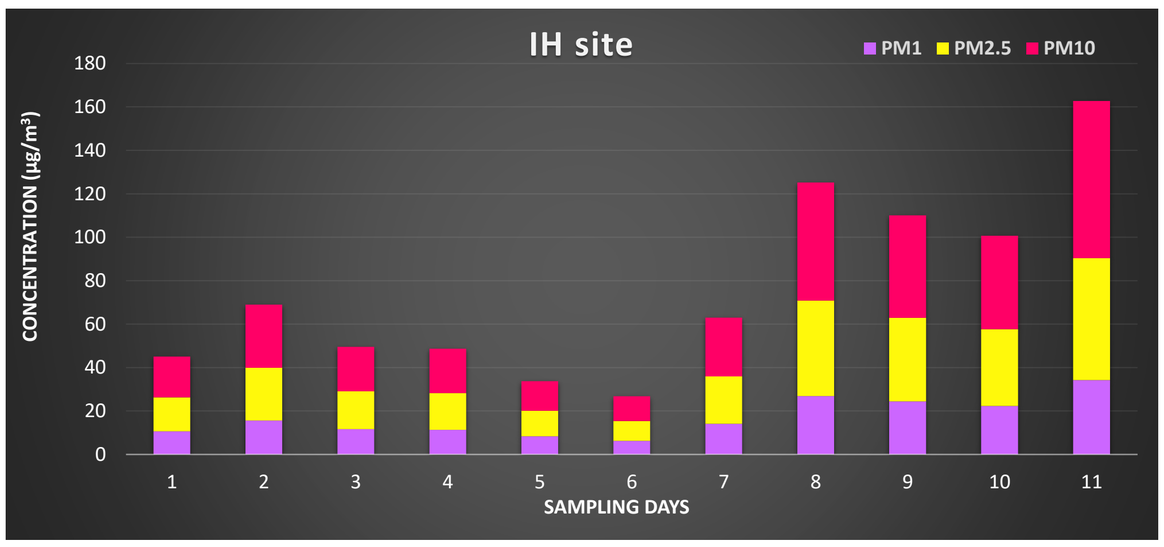


- Measured concentrations of PM_1 at the TRFs and nonTRFs sites were in the range from 7 – 40 µg/m³ and from 4 – 30 µg/m³, respectively. At the IND site, concentration levels ranged from 7 – 88 µg/m³, while at the IH site levels were within the interval from 6 – 34 µg/m³.
- $PM_{2.5}$ concentrations for TRFs, nonTRFs, IND and IH sites ranged between 10 – 67 µg/m³, 5 – 48 µg/m³, 10 – 160 µg/m³ and 9 – 56 µg/m³, respectively.

Measured concentration levels of PM_1, $PM_{2.5}$ and PM_{10} at the industrial and individual household sites



- Concentration levels of PM_{10} at TRFs, nonTRFs, IND and IH sites were within the interval from 11 -73 µg/m³, 6 – 60 µg/m³, 11 – 194 µg/m³ and 11 – 72 µg/m³.



- Sensors were initially calibrated but later colocation campaigns and recalibration strategies are beyond the scope of current work.
- These are a necessary part of the valid data quality assurance procedure for low-cost sensors.
- Sensors enable observations at high spatial resolution in near-real-time, but provide indicative measurements, so the measured coarse results can not be compared to Regulation on Monitoring Conditions and Air Quality Requirements. Official Gazette of the Republic of Serbia, No. 11/10 of 05.03.2010, 75/10 of 20.10.2010 and 63/13 of 19.07.2013.
- Low-cost sensors collected data will be coupled with data obtained from the reference instruments in order to have an accurate picture of the diurnal variation of air pollution.
- Results obtained within the research present the key and necessary step in the process of developing the model for $PM_{2.5}$ particle concentration levels in Novi Sad.

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