Optical particle counter data collected in two inhabited sites close to an industrial hot spot during a three months survey

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Abstract

Data on this paper describe the monitoring of different size ranges of particulate matter on dwellings positioned close to an integral cycle steel plant. Data were collected by eight channel (PM0.3, PM0.5, PM0.7, PM1, PM2, PM3, PM5, PM10) optical particle counters positioned in two sites. The data were recorded as counts-per-minute for every size channel in a three months survey from June to September 2015. Basic statistical elaboration and boxplot graphs as well as raw data are included. The data are related to “Characterization of variability of air particulate matter size profiles recorded by Optical Particle Counters near a complex emissive source by use of Self-Organizing Map algorithm” Licen et al., 2019, in which a statistical elaboration by Self-Organizing Map algorithm is proposed.

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1. Data

The data presented describe monitoring of particulate matter (PM) at dwellings positioned near to an integral cycle steel plant. The counts-per-minute for 8 p.m. size ranges were collected in two sites (see map in Fig. 1) during a three months monitoring campaign (5th June 2015 - 10th September 2015) by Optical Particle Counters (OPCs). Fig. 1 shows a map of the site where the data were collected. Table 1 displays a comparison of data collected in the two sites for each PM size range using basic statistics. Fig. 2 shows boxplot graphs to compare the distribution of the data in the two sites for each PM size range.

2. Experimental design, materials, and methods

2.1. Site description

The data were collected in the city of Trieste (NE- Italy) near dwellings positioned close to an integrated steel plant. In the past years several studies were conducted on the site to assess different pollutant and odor impacts [3–5]. The main renown sources of particulate matter of the plant are the blast furnace [6,7] and carbon and mineral storage areas. Site A and site B are within a radius of 350 m around the above mentioned sources.
named from now on in the text as PM03, PM05, PM07, PM1, PM2, PM3, PM5 and PM10 respectively. The instruments continuously sampled air at 1 l min$^{-1}$ and provided data count per minute for each channel. The three months monitoring campaign was conducted in the period from June to September (5th June 2015–10th September 2015) because it is characterized by the presence of sea breezes blowing from the sea to the inland, i.e., from the steel plant to the city.

2.3. Raw data

The dataset is presented in two comma delimited text files, one for each site. The filename identify the site. The header of the dataset reports the date/time of collection followed by the counts-per-minute for every channel size (see par. 2.2).

2.4. Basic statistics

The basic statistics for the data were evaluated in R software environment [2] and are reported in Table 1.

2.5. Boxplot graphs

The boxplot graphs were produced in R software environment [2] and are reported in Fig. 2. A value has been considered as outlier if it was more than two times the interquartile range from the box.

![Map of the Trieste area which hosts the integrated steel plant. The sampling sites (A and B), the boundary of the steel plant (black line), the position of the blast furnace, the carbon storage area (c.s.a – white line) and the mineral storage area (m.s.a – white line) are highlighted.](image)

**Fig. 1.** Map of the Trieste area which hosts the integrated steel plant. The sampling sites (A and B), the boundary of the steel plant (black line), the position of the blast furnace, the carbon storage area (c.s.a – white line) and the mineral storage area (m.s.a – white line) are highlighted.
Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dib.2019.104250.

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Table 1

|       | Min | Median | Mean | Max |
|-------|-----|--------|------|-----|
|       | Site A | Site B | Site A | Site B |
| PM03  | 341   | 505    | 40816 | 49590 |
| PM05  | 54    | 87     | 1892  | 3067  |
| PM07  | 20    | 41     | 537   | 901   |
| PM1   | 11    | 13     | 317   | 511   |
| PM2   | 4     | 0      | 148   | 214   |
| PM3   | 0     | 0      | 25    | 58    |
| PM5   | 0     | 0      | 4     | 13    |
| PM10  | 0     | 0      | 0     | 1     |

Fig. 2. Boxplot graphs that compare the distribution of the data in the two sites for each PM size range (in counts per minute – y axis in log scale). The red dots represent the mean value. The cross shaped points represent the outliers.
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