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We are grateful for the referee's critical review and comments. We addressed each specific comment and accordingly suggested modifications to the manuscript, which are highlighted in the following. We address one question per page.

Referee's comments/questions in bold upright.
Author's answer in regular upright.
Proposed changes to the pre-print in regular italic.

lines 174-185 - More detail about the site locations would be helpful. The locations are somewhat compromised by the proximity of local sources. For example, N322 appears to be screened by trees to the south and in the middle of a working gardeners yard. S229 appears to be similarly sheltered by trees and a factory building. As the authors note later in the manuscript, both locations are also influenced by contributions not from the airport.

We agree with the referee that the possible influences in terms of advection and local non-airport contributions are not fully reflected in a concise manner yet. Hence, we propose the following changes, including additional figures Fig. 5a-d for the supplement (the measurement containers at each site can actually be "seen" in the digital orthophotographs):

Attaching to line 180:
In order to allow free advection from all wind directions, the locations for both sites were chosen as open as possible. Still due to their positioning within the city areas, both sites are potentially influenced by their closer surroundings.

For site N322 changing the paragraph from lines 182-185:

Original version:
Site N322 to the north is located within the southern urban area of Freising on the premises of a city gardener and is 444 m above mean sea level. The nearest surrounding is characterized by a business park and a highway (A92 and its feeder FS45) spanning from south to south-east. A small meadow is located about 50 m to the west. To the north residential areas predominate.

New version:
Site N322 to the north is located within the southern urban area of Freising on the premises of a city gardener and is 444 m above mean sea level. In close proximity only low frequency traffic from the gardeners activities are expected. The surrounding is characterized by non-manufacturing business parks in about 60 m distance to the northeast and about 200 m distance to the south and southeast, a highway in about 490 m distance, and its feeder in about 50 m distance with frequent traffic spanning from south to southeast. In that direction, with about 35 m distance a single row of trees and shrubs (max. 6 m in height) borders the premises of the city gardener. A small meadow with tree heights of about 20 m is located about 50 m to the west. From about 250 m to the north and northeast residential areas begin to predominate, see Fig. SI5a and SI5c

For site S229 changing the paragraph from lines 187–190:

Original version: *Site S229 to the south is placed on a wide-open space westerly of the city Hallbergmoos and is 456 m above mean sea level. To the east and northeast residential areas can be found. When looking into airport direction north, a business park is situated between the southern runway and site S229. The surroundings in westerly directions are mostly under agricultural use, but crossed by a federal highway B301 in north-south direction.*

New version:
Site S229 to the south is placed on a wide-open space westerly of the city Hallbergmoos and is 456 m above mean sea level. To the east and northeast residential areas are located in about 300 m distance. When looking into airport direction north, a single row of young trees and shrubs spans from 310° to 110°. The shortest distance to S229 is about 12 m. The tree heights vary depending on season about 6 m. In the same direction, a non-manufacturing business park is situated between the southern runway and site S229 in about 250 m distance, with the exception of an automobile manufacturing plant. The surroundings in westerly directions are mostly under agricultural use, but are crossed by a federal highway B301 in north-south direction. Overall, site S229 can be considered under less road traffic influence than N322, see Fig. SI5b and SI5d.

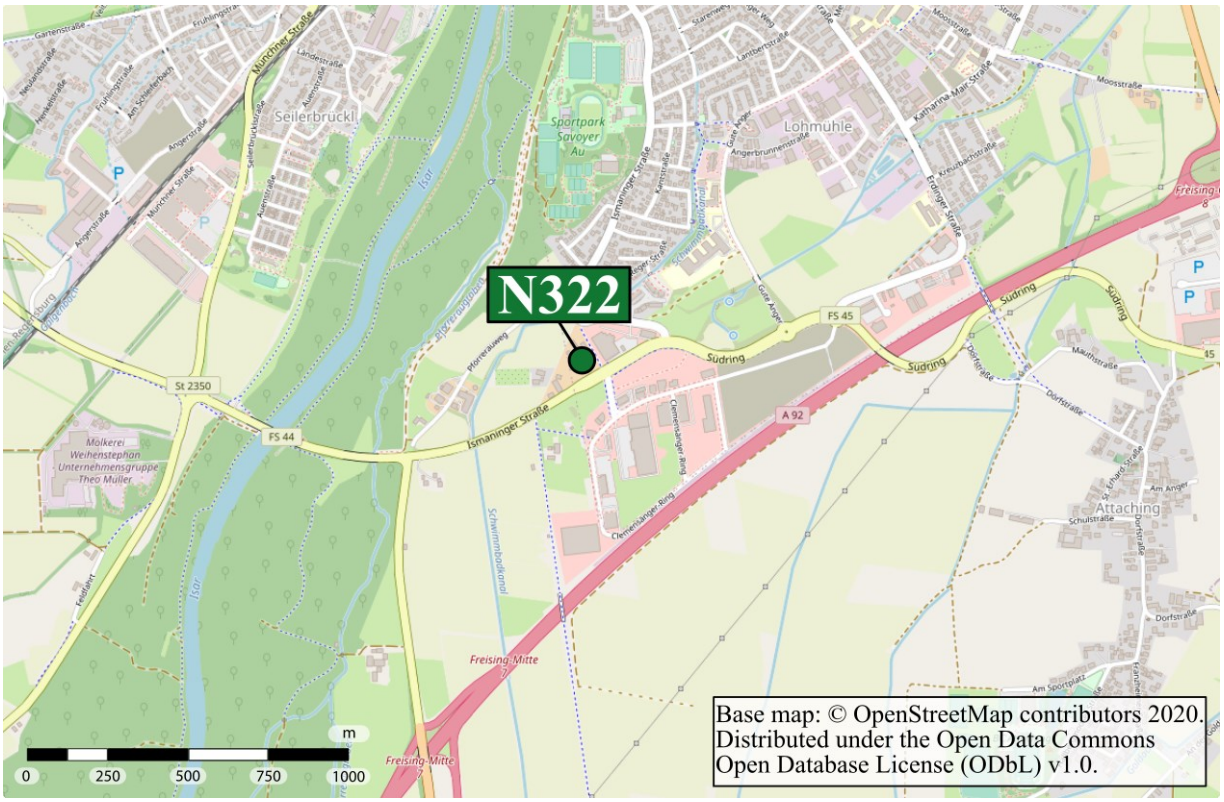

Fig. SI5a: Map section of the immediate surroundings of site N322. Intended to be used together with the information given in Sect 2.2.

Fig. SI5b: Map section of the immediate surroundings of site S229. Intended to be used together with the information given in Sect 2.2.

Fig. SI5c: Digital ortophotograph (DOP) of the immediate surroundings of site N322. DOP with 0.4 m resolution. Intended to be used together with the information given in Sect 2.2. CC BY 4.0, Bayerische Vermessungsverwaltung – www.geodaten.bayern.de. Labels and scale added by the authors.

Fig. SI5d: Digital ortophotograph (DOP) of the immediate surroundings of site S229. DOP with 0.4 m resolution. Intended to be used together with the information given in Sect 2.2. CC BY 4.0, Bayerische Vermessungsverwaltung – www.geodaten.bayern.de. Labels and scale added by the authors.

lines 375-385 - Was any attempt made to correlate departures/arrivals with measurements? Did the airport provide basic aircraft movements and operation modes for the survey periods? This would help to attribute changes in particle diameters to aircraft activity.

The referee raises a valid point. Indeed, we do have information about departures and arrivals as well as on the biggest streets traffic. However, we decided to dedicate a second publication to the detailed analysis of these aspects. We find that the focus on the wind-driven transport of UFP in the surroundings of the airport viewed from the observations at our two sites is for itself an interesting and novel aspect. Starting a new point of discussion with further data would have enlarged the content severely and would have moved the scope of this publication. We hope that the reviewer and editor will understand and kindly refer to the fact that the current manuscript already spans over 600 lines of text and 12 figures.

line 400 - Given the possible screening of the sites by vegetation, do the authors think that meteorology measurements at 5,3m will be sufficiently representative of the sampling inlets at ca.3,0m? Will winter and summer leaf growth cause any differences?

The sampling inlet for UFP is actually 4.2 m above ground level (line 206). The difference in sampling height for UFP data and site-scale meteorological data is hence about 1.1 m. The two sites N322 and S229 were chosen to avoid possible screening through tall vegetation and buildings as good as possible. Nevertheless, as we are located in an urban environment and aimed for measuring at a representative height according to monitoring stations standards, there are some obstacles. The closest objects are:

- meadow of 20 m height 50 m west of N322
- young trees and shrubs of about 6 m height 35 m south of N322
- young trees and shrubs of about 6 m height 12 m north of S229

It is likely that there are seasonal differences due to the greening of the trees. This is suggested from Fig. SI3-5 and discussed briefly in the text in lines 551-553. However, no other tall objects were possibly shielding our stations in any directions.

In the context of this study, we use the 5.3 m wind data to demonstrate the differences in wind direction and speed when moving from the official 10 m measuring height to measuring heights that are closer to the ground and located at the sampling site within the urban street increment. For this purpose, we consider the 5.3 m meteorology measurement to be more representative for our observations than the 10 m airport meteorology. We hypothesized that these differences are important and impact the interpretation of airport studies since they often use the local-scale wind data, which is typically measured at the airport in 10 m height. However, in lines 545-555 (comparing Fig. 7 and 9) we conclude that for the entire year, the overall essence of information on the UFP transport derived from the local and site-scale wind data is mostly comparable. Yet, when analysing smaller-scale temporal and spatial variability (see Fig. SI3-5), the site-scale wind data reveals more insight. For example, Fig. 12 shows a better overlap of local and site-scale cumulated concentration roses for the southern station S229. This is likely due to the open position of the station particularly regarding the main wind directions. Contrastingly, we can observe at N322 that the small meadow in about 50m west to the station seems to act as sufficient screen for wind and hence related particle transport. This is also visible in Figure 2 (h) and (k) where the site scale wind roses for spring and summer at N322 are presented.

line 480-484 - Is it possible to disaggregate the contributions of road traffic from the airport related wind direction for N322? Diurnal traffic flow and composition information might help

Please, see our answer regarding the comment on lines 375-385.

Figures 6 - 8 suggest that arriving and departing aircraft, once they are airborne and beyond the airfield boundaries, have very little influence on measured ground level UFP. Is it worth mentioning this? It's an important observation that is contrary to many other studies.

Yes, interestingly this seems to be true for most of our observations. The analysis of the median modal particle diameter in Figure 8 shows that the southern station S229 exhibits relatively small particles, mostly smaller than 20 nm, for northernly and westerly wind directions. These include the airport, but also possibly airplanes during take-off to southern destinations. Please, find here the respective description in the manuscript:

Lines 379-381: Particularly for the southern site in Hallbergmoos a wide range of wind directions was associated with such small modal diameters. Possibly, this is related to airplanes taking-off during west winds to southern destinations (see Fig. 1 and corridor 26R/L-S/SO).