Response to the Reviewer's Comments #2

AC: The authors are thankful for this review and comments that we followed to substantially improve our manuscript. Here, we provided point-by-point responses below in this document. Author comments (AC) are in **blue** and parts that were changed in the manuscript are in **red**.

General Comment

RC: The authors are presenting a source apportionment study based on the PM10 chemical composition data obtained at an urban background site in Belgrade, Serbia. There were numerous source apportionment studies conducted for the city in the past covering the sampling period from 2003 to 2015. Therefore, the presented study aims to identify the PM10 using recent filter samples collected between June 2023 and May 2024, and a broader spectra of the tracers. However, it is a solid work, the used approach of collecting 24h PM10 filter samples even not every day for a year and analyse them for the standard compounds/tracers is not very innovative and up-to-date. Additionally, this approach doesn't allow a precise differentiation of the PM sources. Therefore, further work for better understanding of PM sources in Belgrade will be needed.

AC: We appreciated and carefully considered the comments regarding our study performed upon data set collected in the Belgrade background site in the framework of WeBaSOOP campaign.

The approach in WeBaSOOP campaign was to collect daily (24h) PM_{10} filter samples every second day for a year and analyse them for 27 elements, 4 ions and OC and EC. To prepare input data for PMF analysis and to include in addition 10 organic tracers in the PMF, 84 exposed filter samples and 6 field blanks were chosen for the analysis according to the procedure described in the study of (Platt et al. 2026). With this, source discrimination was supported by a comprehensive set of chemical variables, including elemental composition, water-soluble ions, OC/EC, biomass-burning tracers, and specific molecular tracers of biogenic aerosol. The combination of these complementary source indicators provides substantially greater chemical constraints than conventional PM_{10} source-apportionment approaches based only on major ions, elements, and carbonaceous aerosols. Therefore, this was the first study in Belgrade Metropolitan area that used levels of polyols and 2-methyltetrols to identify PBAP and BSOA from isoprene sources, which would otherwise be difficult to distinguish, as well as organic tracers for biomass burning.

We agree with reviewer comment that 24-hour sample collection and used methodology aren't innovative, but the substantial contribution of our work was identification of broader spectra of the sources, biogenic aerosols, that haven't been identified so far and which contributed with 20% in total to PM_{10} mass in our study performed for Belgrade urban background sampling site. Therefore, the main added value of the present approach is therefore not improved temporal resolution but improved chemical resolution through the integration of source-specific organic tracers with conventional elemental, ionic and carbonaceous measurements.

Based on the studies found in the literature that were conducted with similar approach, it is well known that 24-hour filter sampling can't resolve diurnal variations, so final solution may result in mixed factors. In paper (Cvetković et al. 2015), where dataset consisted of PAHs, there were identified three factors related to traffic. In addition, in paper of Ćirović et al. (2026), input data consisted of online measured particle size number distribution of ultrafine particles, main pollutants and BC, there were also identified three factors related to traffic. So, we agree that future work is needed, and it would include performing

SA study with at least for two fractions of airborne PM (fine and coarse fraction) as well as combination of offline and online PMF analysis. Combining offline methods, with inclusion of biological tracers, with high-time-resolution measurements of ultrafine particles and equivalent black carbon would improve the identification, more precise differentiation, and quantification of PM sources in Belgrade and of course, the contribution of unregulated biogenic aerosols (Via et al. 2023, Via et al. 2026). There are spectra of instruments for online measurements of organic aerosols suitable for identifying different OA sources as well as for elemental analysis that we plan to include in upcoming studies, depending on our capacity.

References:

Cvetković, A., Jovašević-Stojanović, M., Marković, D., and Ristovski, Z.: Concentration and source identification of polycyclic aromatic hydrocarbons in the metropolitan area of Belgrade, Serbia. Atmos. Environ., 112, 335-343, https://doi.org/10.1016/j.atmosenv.2015.04.034, 2015.

Ćirović, Ž., Stojanović, D. B., Davidović, M., Onjia, A., Garcia-Marlès, M., Lozano, N. P., Alastuey, A., and Jovašević-Stojanović, M.: Concentrations and Estimation of Sources of Ultrafine Particles in the City of Belgrade at Ada Marina Urban Background Site. Environments, 13, 47, https://doi.org/10.3390/environments13010047, 2026.

Platt, S. M., Davidović, M., Bartonova, A., Ćirović, Ž., Eckhardt, S., Evangeliou, N., Gundersen, H., Jovanović, M., Jovašević-Stojanović, M., Močnik, G., Petrović, B., Schneider, P., and Yttri, K. E.: Measurement report: Sources of carbonaceous aerosol in a South-East European metropolis, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2026-1708, 2026.

Via, M., Yus-Díez, J., Canonaco, F., Petit, J.-E., Hopke, P., Reche, C., Pandolfi, M., Ivančič, M., Rigler, M., Prévôt, A. S. H., Querol, X., Alastuey, A., and Minguillón, M. C.: Towards a better understanding of fine PM sources: Online and offline datasets combination in a single PMF. Atmos. Environ., 177, 108006, https://doi.org/10.1016/j.envint.2023.108006, 2023.

Via, M., Demšar, J., Hao, Y., Manousakas, M., Rusanen, A., Jiang, J., Grange, S. K., Jaffrezo, J.-L., Dinh, V. N. T., Uzu, G., Močnik, G., and Daellenbach, K. R.: Chemical sparsity in Bayesian receptor models for aerosol source apportionment, Atmos. Meas. Tech., 19, 2175–2195, https://doi.org/10.5194/amt-19-2175-2026, 2026.

2. Material and methods

RC: The section is quite brief and some information/parts are missing e.g. detailed information about filter sampling as duration and frequency, meteorological measurements, FLEXPART and HYSPLIT model description and settings.

AC: We addressed reviewer's comments in manuscript by adding more information regarding filter sampling:

Row 135 - 137

"Daily filter samples were collected for 24 hours. The field campaign lasted for one year, and for PMF analysis seven representative samples for each month were used which yielded in 84 PM_{10} samples."

meteorological parameters:

Row 118 - 121

"Our sampling campaign was performed at an urban background monitoring site Ada Marina (44.790166° N, 20.4169° E; 71 m above sea level) which is a part of the local air quality network in Belgrade Metropolitan (Fig. 1) where main air pollutants and meteorological parameters (temperature, relative humidity, wind speed, wind direction and atmospheric pressure) have been measured."

and we added the section 2.7. named Air mass transport modelling where we described FLEXPART and HYSPLIT settings used:

Row 211 – 230

2.7. Air mass transport modelling

"To examine and support the physical plausibility of the resolved PMF factors that they represent realistic local and transported sources influencing the monitoring site, backward trajectories and polar plots analysis were performed. To understand airmass transport to the Ada Marina station, the standard ATMO-ACCESS Research Infrastructure (https://flexpart-request.nilu.no/data-access) set-up was used for dust. Specifically, the Lagrangian particle dispersion model FLEXPART version 10.4 (Pisso et al., 2019) ran in the classic retroplume mode for 30 days backward in time for 3-hourly timesteps. The model was driven by ECMWF ERA5 reanalysis (Hersbach et al., 2019) with 0.5° spatial and hourly temporal resolution over 137 vertical levels. The resulting footprint emission sensitivity expresses the probability of potential emissions to arrive at Ada Marina, showing airmass origin, and can be converted to atmospheric concentrations at the receptor (Ada Marina) if combined with an emission dataset. For dust, emissions were first calculated using the FLEXDUST module (Groot Zwaaftink et al., 2016). FLEXDUST uses input parameters, such as soil type, vegetation/snow cover, threshold friction velocity, particle-size classes combined with surface and meteorological conditions from ECMWF ERA5 data (0.25° resolution, hourly) to calculate gridded emission fluxes for 10 size-classes of dust particles from 0.2 to 20 µm.

Beside FLEXPART, air mass transport modelling was performed also by Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) transport and dispersion model developed by the National Oceanic and Atmospheric Administration (NOAA). The 24h back-trajectories used GFS Meteorological Data and vertical velocity model and were calculated at 100 m, 200 m and 500 m above ground level.

The directional dependence and temporal behaviour of each factor was examined using polarPlot function from the openair (version 2.18-2), R package (version 4.4.2) (Carslaw, 2012)."

2.6. PMF model

RC: The section has to be revised.

- RC: First and only equation of the paper quoted with number "4".

  AC: Thanks for this correction, we corrected it with number "1".

- RC: Glojek et al., 2024 is not an original paper see Glojek et al., 2024.

  AC: We now changed the document we cited previously in this section.

  Row 176 - 177

"For those species below LOD, the uncertainties were calculated as 5/6 of the LOD (Polissar et al. 1998)."

- RC: Table S2 not cited at all in the main text.

  AC: Thanks for pointing this out. As we lengthened the methodology part regarding PMF modelling, we moved Table S2 from the Supplement Material to manuscript and cited it now in the text as Table 2.

  Row 202 - 203

  "In case of DISP test, no factor swaps were reported and the change in Q value remained minimal (-0.013). BS analysis based on 100 runs is showed in Table 2."

- RC: Table S4 cite earlier than Table S3 in the main text.

  AC: You are right and, as Figure S1 was analogue to Table S4, we removed Table S4 from the Supplement Material at all. Furthermore, as we removed Table S2 from the Supplement Material to manuscript in 2.6. PMF modelling section, previous Table S3 became Table S2 in revised Supplement Material.

- RC: Sentence 151-151 is not easy to follow.

  AC: We addressed this comment trying to paraphrase the sentence to be clearer.

  Row 175 - 177

  "In the model, if the concentrations of the species were assigned as "below LOD", a value equal to 1/2 od the LOD was entered. For those species below LOD, the uncertainties were calculated as 5/6 of the LOD (Polissar et al. 1998)."

RC: Questions:

What are the S/N ratios and LODs for Rb, Sr, Cd, Sb and Sn?

How was the PM10 uncertainty calculated?

Was the total variable (PM10) considered as "weak"?

AC: In the Table below, we summarised the S/N ratios and LODs for Rb, Sr, Cd, Sb and Sn:

	S/N ratio	LOD
Rb	3.2	0.1 ng/m^3
Sr	3.7	0.1 ng/m^3
Cd	2.3	0.04 ng/m^3
Sb	1.7	0.5 ng/m^3
Sn	2.4	1 ng/m^3

PM_{10} was considered as total variable, as "strong" and uncertainty was calculated by multiplying PM_{10} concentration value by 4.

3. Result and discussion

RC: I recommend to present the average values with SD and use same number of decimal numbers in the whole manuscript.

AC: Thank you for this recommendation. We corrected number of decimal places in the whole manuscript to be the same for all decimal numbers and the average values with SD are shown in Table S2 where seasonal levels of analysed species are shown.

The Table S2 in the Supplement Material:

Table S2. Seasonal levels of analysed species (ng m^{-3}) in Belgrade during WeBaSOOP campaign (N=84).

Species	N	Average (± SD)	Spring (± SD)	Summer (± SD)	Autumn (± SD)	Winter (± SD)	NH (± SD)	H (± SD)
PM_{10}*	84	23943 (± 14867)	20107 (± 9724)	20289 (± 7754)	23283 (± 19876)	32537 (± 17456)	19272 (± 7750)	28189 (± 18259)
OC	84	8185 (± 6489)	5288 (± 1790)	6412 (± 2326)	8441 (± 8330)	12996 (± 8313)	5936 (± 2255)	10230 (± 8227)
EC	84	1384 (± 1030)	927 (± 450)	933 (± 362)	1636 (± 1106)	2140 (± 1371)	955 (± 492)	1774 (± 1225)
OM	84	11459 (± 9085)	7403 (± 2506)	8977 (± 3257)	11818 (± 11662)	18194 (± 11638)	8310 (± 3157)	14322 (± 11518)
Cl^-	84	135 (± 185)	70 (± 119)	25 (± 49)	178 (± 169)	285 (± 237)	26 (± 39)	234 (± 208)
NO_3^-	84	1294 (± 1498)	615 (± 345)	364 (± 131)	1647 (± 1486)	2709 (± 1894)	478 (± 364)	2035 (± 1740)
SO_4^{2-}	84	2531 (± 1874)	2140 (± 1194)	3201 (± 2176)	2213 (± 2564)	2532 (± 1296)	2967 (± 2174)	2135 (± 1467)
NH_4^+	84	673 (± 541)	444 (± 299)	776 (± 609)	672 (± 652)	815 (± 522)	716 (± 572)	634 (± 514)
Na	83	158 (± 132)	156 (± 159)	74 (± 31)	196 (± 123)	211 (± 135)	82 (± 73)	225 (± 137)
Mg	84	109 (± 105)	128 (± 174)	82 (± 49)	107 (± 80)	117 (± 61)	79 (± 69)	135 (± 125)
Al	83	409 (± 426)	572 (± 694)	347 (± 219)	282 (± 253)	412 (± 291)	338 (± 303)	471 (± 506)
K	84	353 (± 385)	219 (± 162)	142 (± 67)	411 (± 439)	672 (± 488)	157 (± 88)	531 (± 459)
Ca	84	492 (± 413)	611 (± 643)	432 (± 252)	395 (± 246)	507 (± 328)	416 (± 320)	561 (± 476)
V	84	1.67 (± 1.48)	1.35 (± 1.27)	0.91 (± 0.57)	1.67 (± 1.21)	2.83 (± 1.89)	0.91 (± 0.69)	2.37 (± 1.66)
Cr	66	2.59 (± 2.41)	4.62 (± 2.80)	1.24 (± 0.94)	0.84 (± 0.90)	3.21 (± 2.22)	1.67 (± 1.90)	3.42 (± 2.53)
Mn	81	7.29 (± 5.20)	7.82 (± 6.66)	6.09 (± 3.20)	6.59 (± 4.02)	8.66 (± 6.10)	5.87 (± 3.79)	8.49 (± 5.92)
Fe	80	497 (± 375)	512 (± 444)	412 (± 234)	463 (± 291)	603 (± 477)	391 (± 246)	584 (± 439)
Co	80	0.12 (± 0.12)	0.14 (± 0.17)	0.10 (± 0.08)	0.12 (± 0.13)	0.13 (± 0.10)	0.08 (± 0.08)	0.15 (± 0.14)

Ni	84	2.07 (± 1.24)	2.49 (± 1.20)	1.43 (± 0.86)	1.94 (± 0.97)	2.42 (± 1.55)	1.67 (± 0.84)	2.44 (± 1.43)
Cu	64	6.00 (± 7.06)	2.67 (± 2.58)	2.66 (± 2.18)	9.38 (± 8.20)	8.49 (± 8.91)	2.40 (± 2.14)	8.46 (± 8.16)
Zn	54	19.17 (± 20.80)	3.52 (± 4.02)	6.93 (± 6.82)	26.38 (± 18.70)	24.48 (± 25.36)	9.22 (± 13.21)	23.00 (± 22.02)
Ga	71	0.10 (± 0.10)	0.17 (± 0.18)	0.07 (± 0.05)	0.07 (± 0.07)	0.09 (± 0.05)	0.08 (± 0.07)	0.11 (± 0.12)
As	80	1.01 (± 0.90)	0.59 (± 0.48)	0.57 (± 0.39)	1.28 (± 0.77)	1.63 (± 1.21)	0.62 (± 0.52)	1.34 (± 1.01)
Se	82	0.33 (± 0.17)	0.32 (± 0.19)	0.36 (± 0.11)	0.32 (± 0.20)	0.34 (± 0.17)	0.33 (± 0.15)	0.33 (± 0.18)
Rb	84	0.86 (± 0.88)	0.68 (± 0.75)	0.49 (± 0.27)	0.87 (± 0.95)	1.44 (± 1.10)	0.45 (± 0.34)	1.24 (± 1.04)
Sr	84	1.97 (± 2.13)	2.67 (± 3.48)	1.46 (± 1.10)	1.71 (± 1.46)	1.98 (± 1.22)	1.61 (± 1.33)	2.31 (± 2.62)
Cd	84	0.16 (± 0.15)	0.09 (± 0.08)	0.08 (± 0.06)	0.17 (± 0.15)	0.29 (± 0.17)	0.08 (± 0.06)	0.22 (± 0.17)
Ba	83	11.24 (± 8.38)	5.78 (± 2.95)	8.05 (± 4.74)	15.84 (± 6.67)	16.35 (± 11.29)	7.41 (± 5.04)	14.80 (± 9.32)
Pb	81	3.27 (± 2.90)	2.60 (± 2.46)	2.39 (± 1.58)	3.50 (± 2.56)	4.64 (± 3.99)	2.36 (± 2.12)	4.04 (3.21)
P	84	19.31 (± 12.32)	25.73 (± 16.60)	21.62 (± 7.63)	11.22 (± 7.75)	16.80 (± 9.78)	21.20 (± 11.05)	17.59 (± 13.26)
Ti	81	20.09 (± 27.58)	35.83 (± 46.59)	16.30 (± 9.64)	12.33 (± 11.82)	16.81 (± 9.67)	17.08 (± 15.11)	24.63 (± 34.94)
Zr	58	1.98 (± 1.60)	2.76 (± 1.72)	1.98 (± 1.40)	1.54 (± 1.87)	1.65 (± 1.32)	2.07 (± 1.59)	1.92 (± 1.62)
Mo	66	12.46 (± 12.25)	11.56 (± 5.24)	26.50 (± 14.37)	7.01 (± 12.48)	7.79 (± 7.14)	20.66 (± 13.66)	6.04 (± 5.42)
Sb	83	1.11 (± 0.92)	1.14 (± 1.03)	0.82 (± 0.52)	0.96 (± 0.70)	1.50 (± 1.15)	0.76 (± 0.52)	1.41 (± 1.08)
Sn	74	6.41 (± 6.79)	3.15 (± 2.40)	2.73 (± 2.58)	11.65 (± 8.77)	7.76 (± 6.68)	3.32 (± 4.15)	8.52 (± 7.45)
Galactosan	84	12.51 (± 22.34)	1.76 (± 3.10)	0.57 (± 0.37)	16.21 (± 25.82)	33.60 (± 26.91)	0.90 (± 1.12)	23.05 (± 26.89)
Mannosan	84	55.3 (± 103.3)	7.9 (± 14.1)	2.1 (± 1.2)	65.6 (± 116.1)	154.0 (± 128.8)	3.6 (± 4.9)	102.2 (± 125.9)
Levoglucosan	84	413.0 (± 682.3)	74.8 (± 116.7)	34.3 (± 15.5)	545.7 (± 779.6)	1066.4 (± 804.1)	48.4 (± 59.1)	744.4 (± 812.0)
2-methylerythritol	84	5.01 (± 7.97)	3.51 (± 4.58)	14.44 (± 9.75)	1.01 (± 1.50)	0.21 (± 0.10)	10.15 (± 9.14)	0.35 (± 0.34)
2-methylthreitol	84	2.05 (± 2.78)	1.43 (± 1.51)	5.51 (± 3.14)	0.78 (± 0.85)	0.21 (± 0.09)	3.97 (± 3.03)	0.31 (± 0.28)
Glucose	84	39.69 (± 25.93)	46.60 (± 25.94)	60.27 (± 24.71)	31.97 (± 15.09)	17.16 (± 10.43)	58.46 (± 23.73)	22.62 (± 12.72)
Fructose	84	10.16 (± 8.46)	15.37 (± 8.73)	15.09 (± 7.56)	6.41 (± 4.76)	2.51 (± 1.44)	16.32 (± 7.54)	4.57 (± 4.41)
Mannitol	84	39.50 (± 32.85)	45.73 (± 27.52)	74.03 (± 28.88)	24.81 (± 16.04)	9.12 (± 5.58)	66.68 (± 27.15)	14.80 (± 10.14)
Arabitol	84	34.84 (± 26.85)	43.67 (± 25.22)	57.73 (± 24.05)	25.02 (± 16.57)	9.63 (± 5.55)	56.75 (± 21.63)	14.93 (± 10.73)

Trehalose	84	16.17 (± 11.51)	20.41 (± 13.15)	25.17 (± 9.36)	11.07 (± 5.26)	6.48 (± 3.49)	24.51 (± 11.17)	8.59 (± 4.37)
Inositol	77	3.15 (± 2.16)	3.55 (± 2.48)	3.83 (± 1.77)	2.92 (± 1.55)	1.71 (± 2.28)	3.96 (± 2.12)	2.26 (± 1.85)
Erythritol	84	4.36 (± 5.17)	4.08 (± 5.07)	8.19 (± 7.13)	2.77 (1.99)	2.00 (1.34)	6.95 (± 6.42)	2.00 (± 1.54)

RC: Fig. 2 I recommend to change y axis to µg/m^3. Please discuss the difference in "unaccounted" part during the seasons.

AC: Thanks for this comment as it substantially improved this part of the manuscript. We changed y axis to µg/m^3 and the "unaccounted" part is discussed in the end of the second paragraph of the 3.1. PM_{10} mass concentration and chemical composition section.

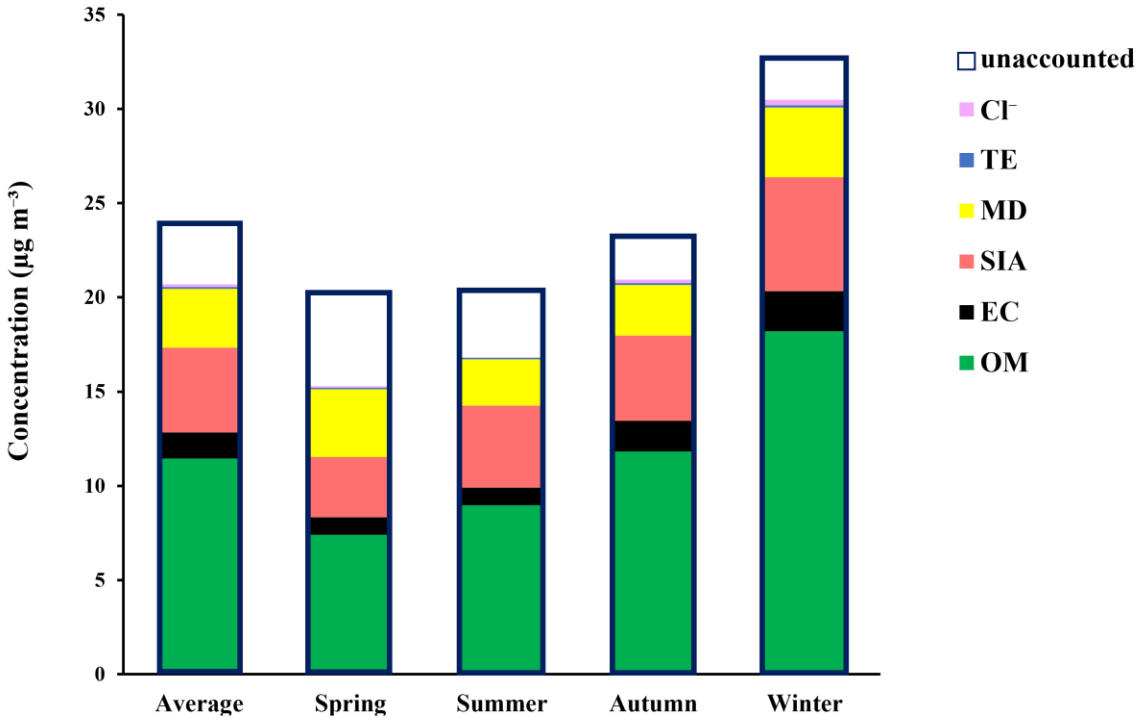

Figure 2. Major composition of PM_{10} in Belgrade on annual level and during different seasons. Every bar represents total PM_{10} on annual and seasonal average concentration. Major PM_{10} reconstructed components were: OM – organic matter, EC – elemental carbon, SIA – secondary organic aerosol, MD – mineral dust, TE – trace elements. (Row 260)

Here is the part of the manuscript where we discussed "unaccounted" mass:

Row 252 - 256

"The unaccounted PM_{10} mass concentration on average was 3.2 µg m^{-3} which is around 16%. During spring, the unaccounted PM_{10} mass was the highest, 4.8 µg m^{-3} while during winter was two times lower (2.0 µg m^{-3}). The higher fraction of unaccounted mass might be attributed to the particle-bound water content of PM_{10}, and/or conversion factors adopted for OM and mineral dust which represent simplified calculations and may lead to uncertainties (Terzi et al. 2010)."

RC: Fig. S1 is analogue to Tab. S4.

AC: You are right, we removed Table S4 as it showed the same information as Figure S2. Figure S2 used to be Figure S1 but we added Fig. S1 with sampling sites of the studies conducted in Belgrade for the period 2003 – 2015 in the Supplement Material and changed ordinary numbers of the figures accordingly.

RC: Fig. 3 and 4 used abbreviations, which should be clarified in the figure's legend.

AC: Thanks for pointing this out, the abbreviations in the captions of Figures 3 and 4 are added now.

Row 274

"Figure 3. Chemical profiles of the PMF factors in Belgrade Ada Marina. The names of the species are shown on x-axis, on y-axis are shown chemical concentrations od the species in ng m-3 with mean DISP values (white dots) and DISP confidence intervals (error bars). On the secondary y-axis are shown relative contributions of the species apportioned by the factor (black dots). Biomass burning (BB); Long range transport and local combustion (NaCl/COMB); Mineral dust (MD); Primary biological aerosol (PBAP); Biogenic secondary organic (BSOAIsopprene); Traffic/ Industry (TRA/IND)."

Row 281

"Figure 4. Daily factor contribution to PM_{10} mass concentration during one-year campaign (left) and wind polar plots with normalized concentration of the apportioned PMF factors (right). Biomass burning (BB); Long range transport and local combustion (NaCl/COMB); Mineral dust (MD); Primary biological aerosol (PBAP); Biogenic secondary organic ($BSOA_{Isopprene}$); Traffic/ Industry (TRA/IND)."

RC: Questions:

How was "mineral dust" calculated?

What represent the whiskers in the Fig. 4?

AC:

Mineral dust was calculated according to the formula from (Querol et al. 2001):

MD = [Ca] x 1,5 + [Al]/0.53 x 2.5 + [Al]/0.53 + [Na] + [Mg] + [K] + [Fe]

Reference:

Querol, X., Alastuey, A., Rodriguez, S., Plana, F., Ruiz, C.R., Cots, N., Massagué, G., Puig, O.: PM10 and PM2.5 source apportionment in the Barcelona Metropolitan Area, Catalonia, Spain. Atmos. Environ., 35, 6407–6419. https://doi.org/10.1016/S1352-2310(01)00361-2, 2001.

The whiskers in the Fig. 4 represent min, mean and max of DISP values obtained from the PMF output.

4. Conclusion

RC: Most of the text is rather summary than conclusion(s).

AC: You are right. We rewrite the conclusion following the ACP guidelines for comment section.

Row 538 - 545

"Eight SA studies were conducted in the past in Belgrade urban and Metropolitan area upon data sets collected in the period from 2003 and 2015 and WeBaSOOP year-long campaign in 2023-2024. Although WeBaSOOP study was conducted upon data set collected eight years after the last study and having different, broader range of, species used for SA, factors traffic, industry, different combustion sources, mineral/soil dust and secondary inorganic aerosol were identified in all studies in the past and ours. This indicates a continuity of these factors throughout the years on air quality in Belgrade. One study performed on data sets collected 15 years ago identified marine aerosol also but with higher contribution than in our, WeBaSOOP, study. However, in contrast to other studies, this was the first one that identified factors from biological origin (PBAP and $BSOA_{Isoprene}$)."

Row 563

"Our results showed influence of both, local (biomass burning, traffic, biogenic aerosols) and regional sources (mineral dust, salt from long-range transport) on PM_{10} concentration in this area."

Row 567 - 569

"However, further work for better understanding of PM_{10} regional and local sources in Belgrade is needed by performing SA study at least for two fractions of airborne PM represent by fine and coarse fraction as well as combination of offline and online PMF analysis and long-term measurements."

Row 570 - 580

"Mineral dust events, marine aerosol and biogenic aerosols contribute to the background concentration of PM_{10} and $PM_{2.5}$ and are largely beyond the scope of emission control measures. Although sea salt was not extracted as a separate factor in WeBaSOOP study, its contribution to PM_{10} mass may be accounted as 1-2 $\mu g/m^3$, but in case of mineral dust, contribution is estimated to be around 4 $\mu g/m^3$. In WeBaSOOP study, mineral dust represents mix of both natural and anthropogenic sources from local and long-range transport, while 1/5 of PM_{10} mass (around 5 $\mu g/m^3$) was attributed to primary and secondary airborne particulate matter of biogenic sources. As emissions from these sources are beyond controllable measures compliance with ambient air quality limit values consequently requires sufficient reductions in controllable anthropogenic emissions to offset the irreducible natural background. Where legislation permits, documented contributions from specific natural sources, such Sahara dust events and sea salt, may be excluded from compliance assessment. However, routine exclusion of biogenic aerosol contributions is generally not possible to be applied without measurements such WeBaSOOP study enabled."