1   **S1 - ACSM collection efficiency**

2   The CE found in this study was 0.5, and it is in accordance to other studies in environments dominated by organic aerosols

3   (Middlebrook et al., 2012; Ng et al., 2011) as well as in other studies in the Amazon (Ponczek et al., 2021; de Sá et al., 2019).

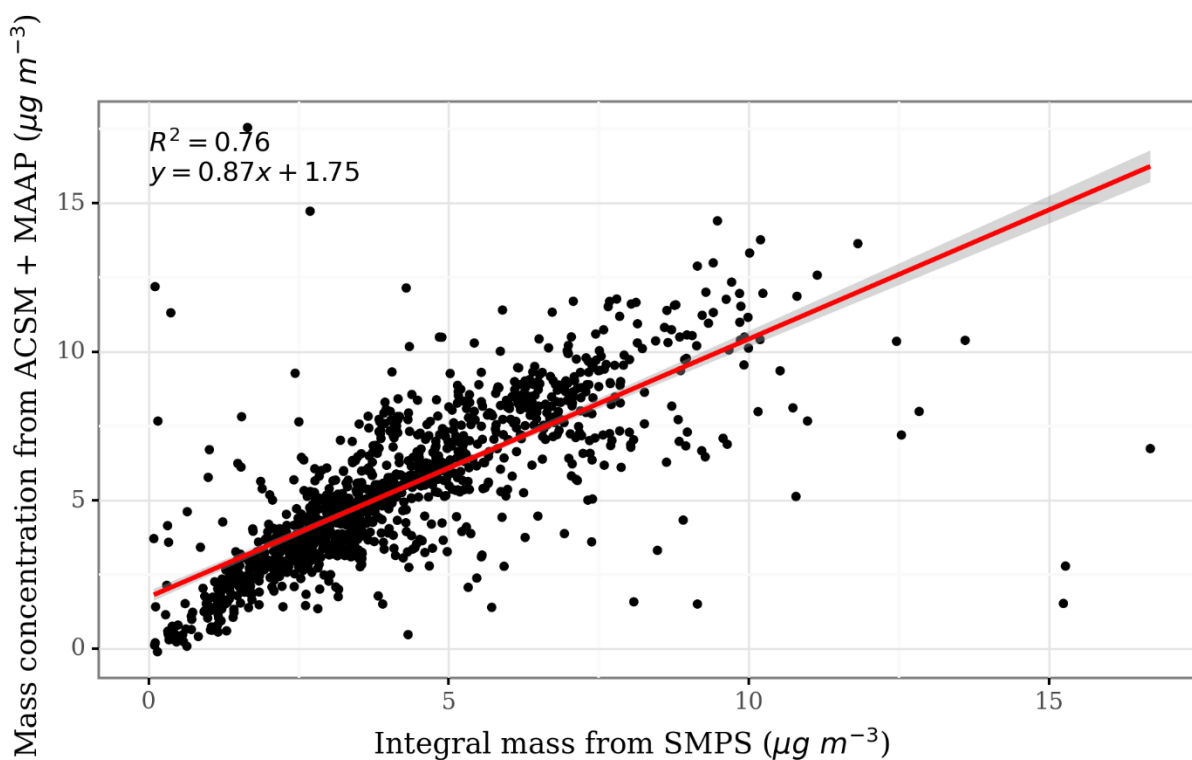
4   However, it was different from the CE during the wet season in the same site as in our study (CE=1, (Chen et al., 2015), and

5   from an area highly impacted by local fires (CE = 1, (Brito et al., 2014)). To convert the integrated volume of the SMPS

6   measurements to mass concentration the density of the compounds was considered 1.78 g cm^{-3} for SO$_4$, 1.77 g cm^{-3} for eBC,

7   1.72 g cm^{-3} for NH$_4$ and NO$_3$, and 1.48 g cm^{-3} for the organics (Brito et al., 2014). The mean density of all the PM1 aerosols

8   measured in our study was 1.54±0.02 g cm^{-3} and was multiplied by the total volume estimated from the SMPS measurements

9   to obtain the integral mass.

11   Figure S1 – Collection efficiency validation combining the mass concentration of non-refractary submicrometer particles

12   (ACSM) and eBC (MAAP) with the integral mass from the SMPS.

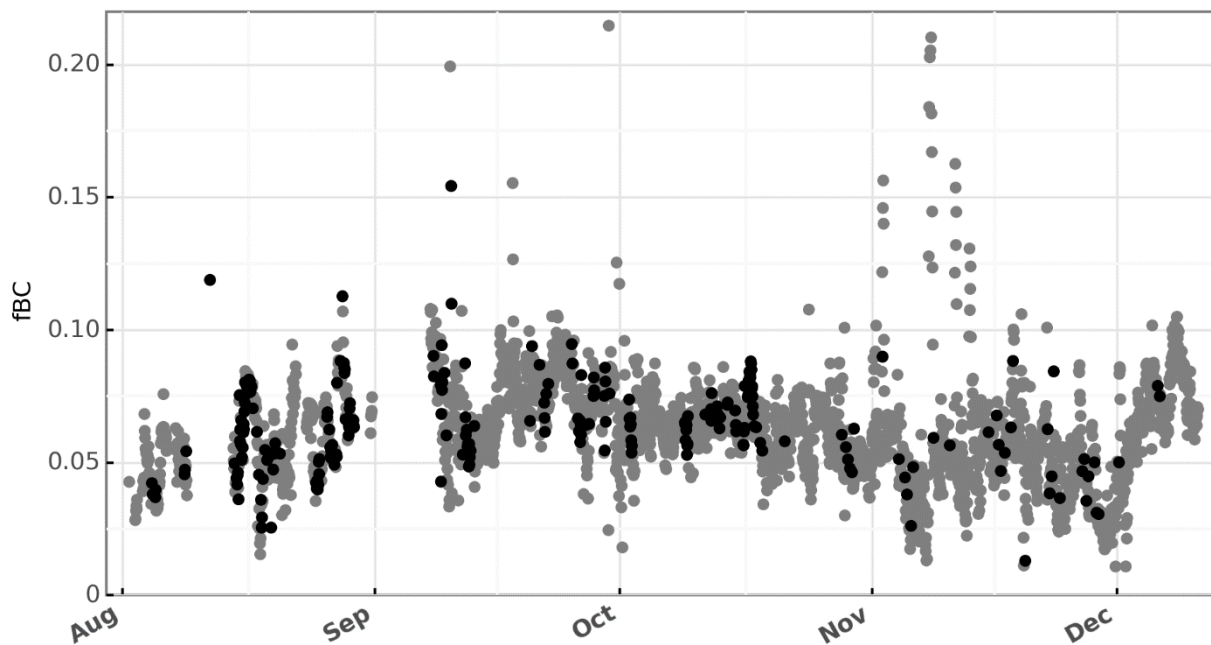
13 **S2 – Generator filter by wind direction**

14 Time series of the fBC, where gray points represent data which passed the filter criteria and was included in the results, and

15 black points represent the data which was filtered out of the analysis because if was the criteria of either the wind direction

16 was between 270-340° (for local diesel generator contamination, from our local wind direction measurements) or when the

17 calculated backtrajectories from the Hysplit model (Draxler and Hess, 1998) passed over Manaus coordinates, as in (Whitehead

18 et al., 2016). About 17% of the data was filteres out in this process.

19

20 Figure S2 – Time series of the fBC, where black dots indicate the data points filtered out due possible contamination from

21 pollution from Manaus or/and the generator.

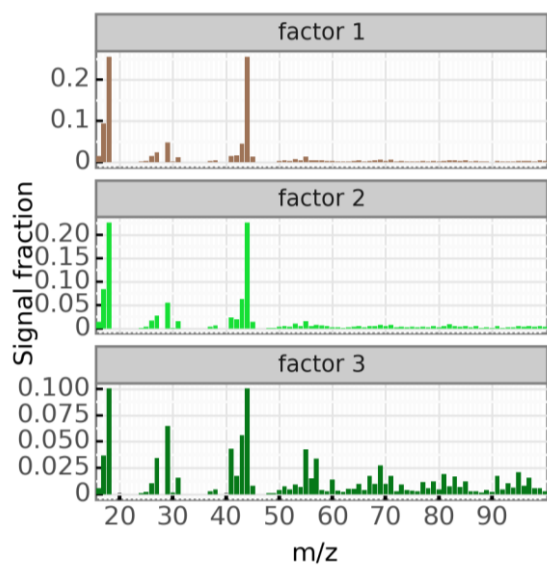
22 **S3 - PMF factors**

23 **S3.1 - Signal fractions**

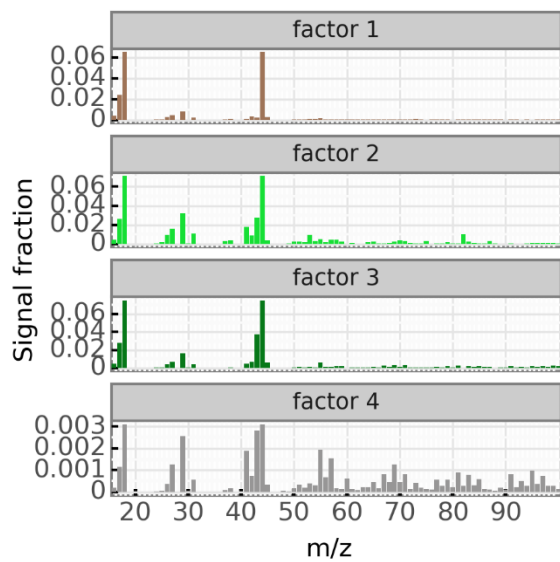
24 Table S3.1 – Comparison of different parameters of validation of the nmber of PMF factors

Number of factors	Q/Q expected	fPeak or seed
3	0.31	-0.2
4	0.29	0

25

26   **S3.1.1 - 3 Factors solution**

27

28   Figure S3.1 – Signal fractions of the PMF for a 3 factors solution.

29   **S3.1.2 - 4 factors solution**

30

31   Figure S3.2 – Signal fractions of the PMF for a 4 factors solution.

32

S3.2 - Pearson`s R

S3.2.1 - 3 factors

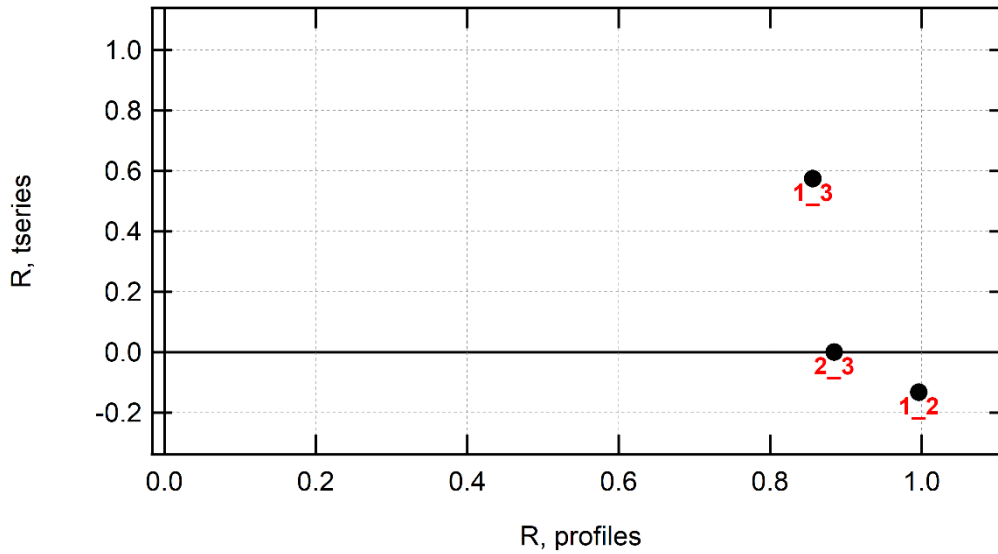



Figure 3.2.1 – Pearson`s R for the correlations between the time series and the mass spectra of any 2 factors for the PMF

solutions with 3 factors.

S3.2.2 - 4 factors

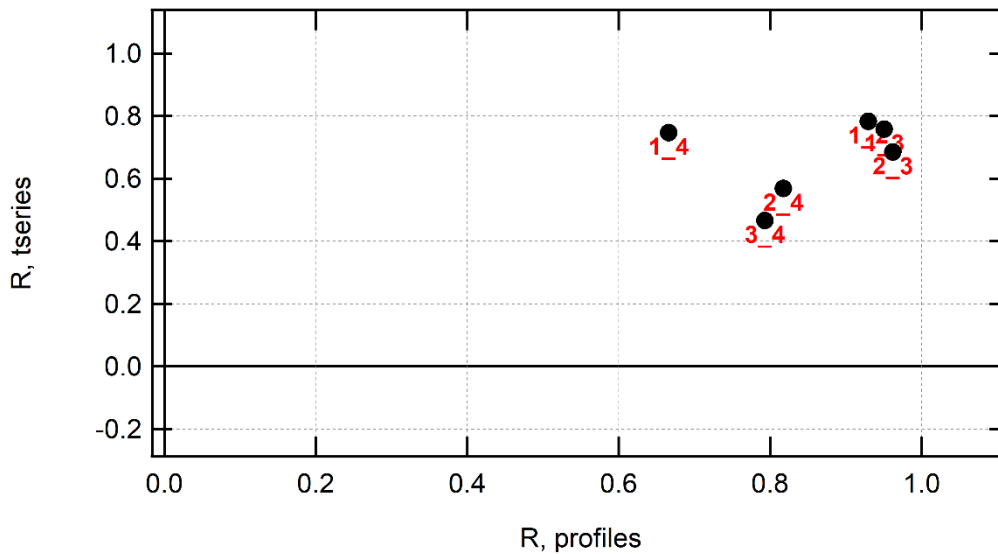
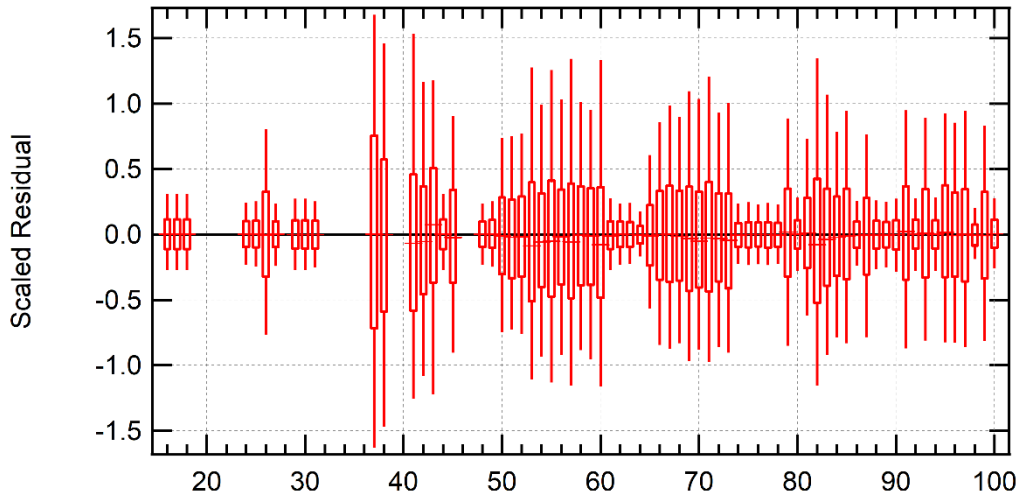



Figure 3.2.2 – Pearson`s R for the correlations between the time series and the mass spectra of any 2 factors for the PMF

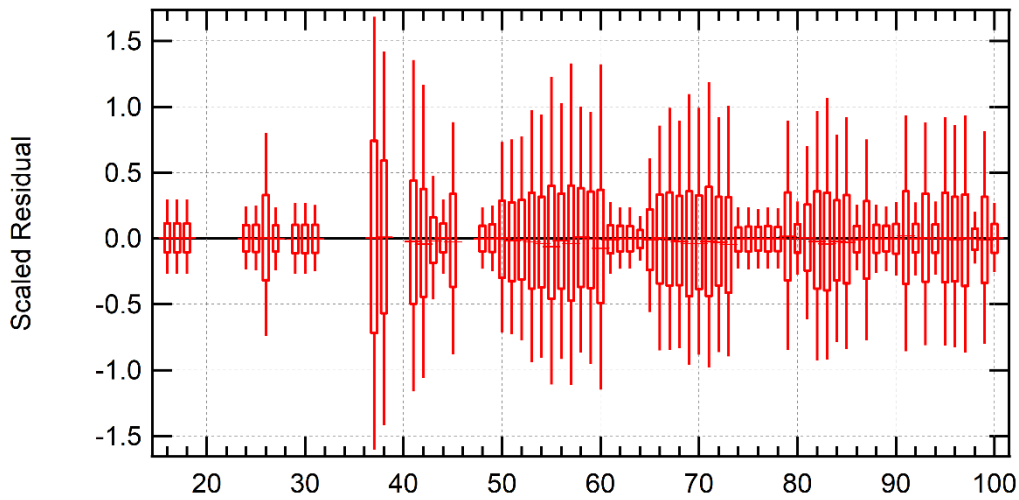
solutions with 4 factors.

42 **S3.3 - Scaled residuals for all m/z`s**

43 **S3.3.1 - 3 factors solution**

44

45 Figure S3.3.1 – Scaled residuals for the PMF solution with 3 factors.

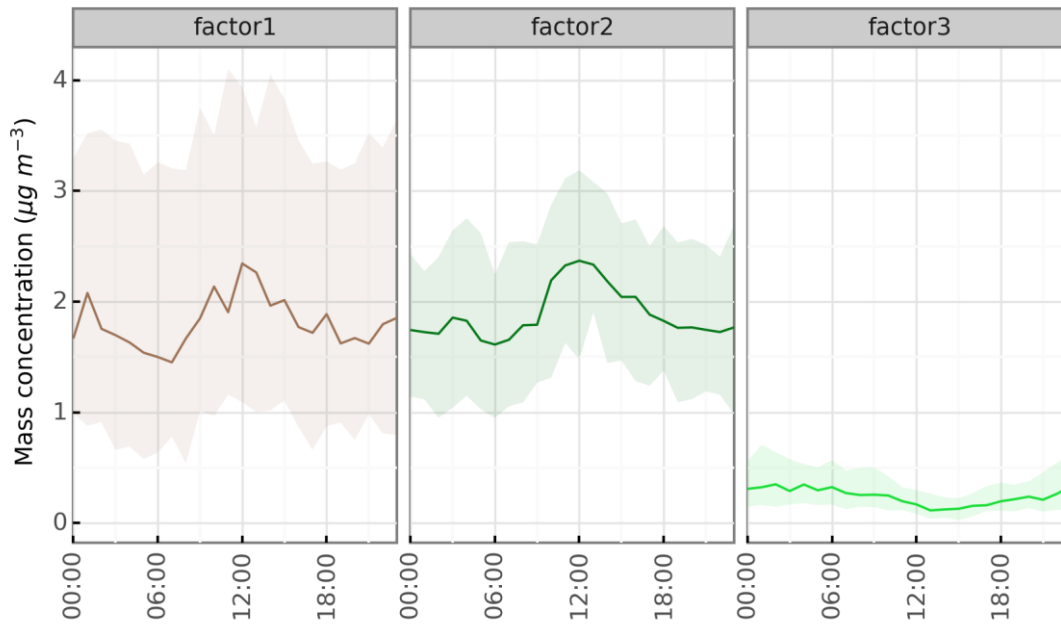
46 **S3.3.2 - 4 factors solution**

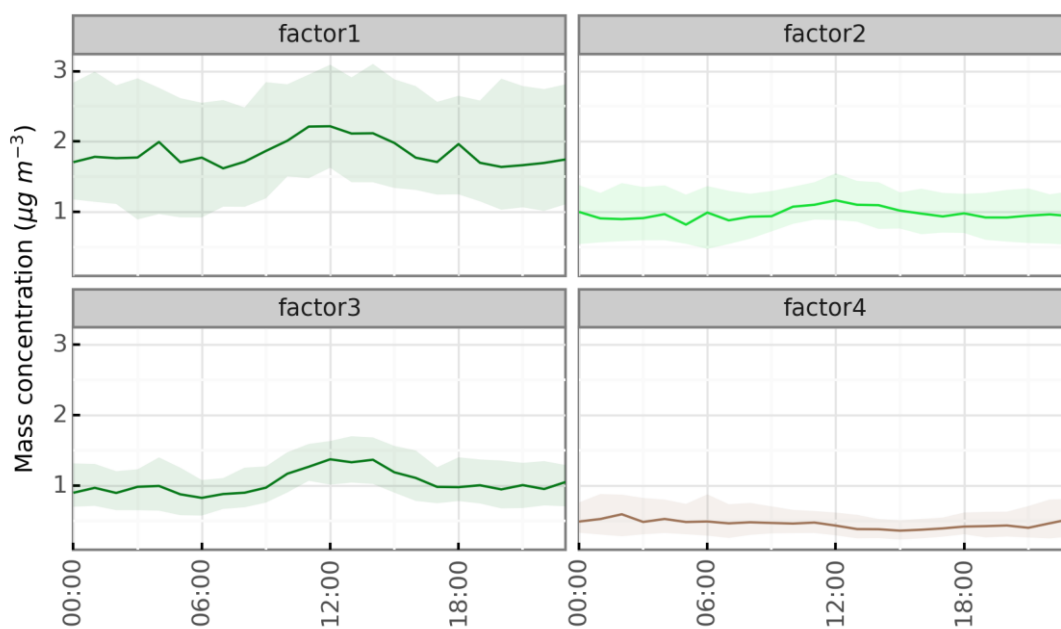
47

48

49 Figure S3.3.2 – Scaled residuals for the PMF solution with 4 factors.

50

51 **S3.4 - Diel cycles**

52 **S3.4.1 - 3 factors**

53

54 Figure S3.4.1 – Diel cycles of the different PMF factors for a 3 factors solution.

 S3.4.2 - 4 factors

57   Figure S3.4.2 – Diel cycles of the different PMF factors for a 4 factors solution.

 S4 - Correlation matrixes

 S4.1 - 3 factor solution based on 4 factors solution, with 2 combined:

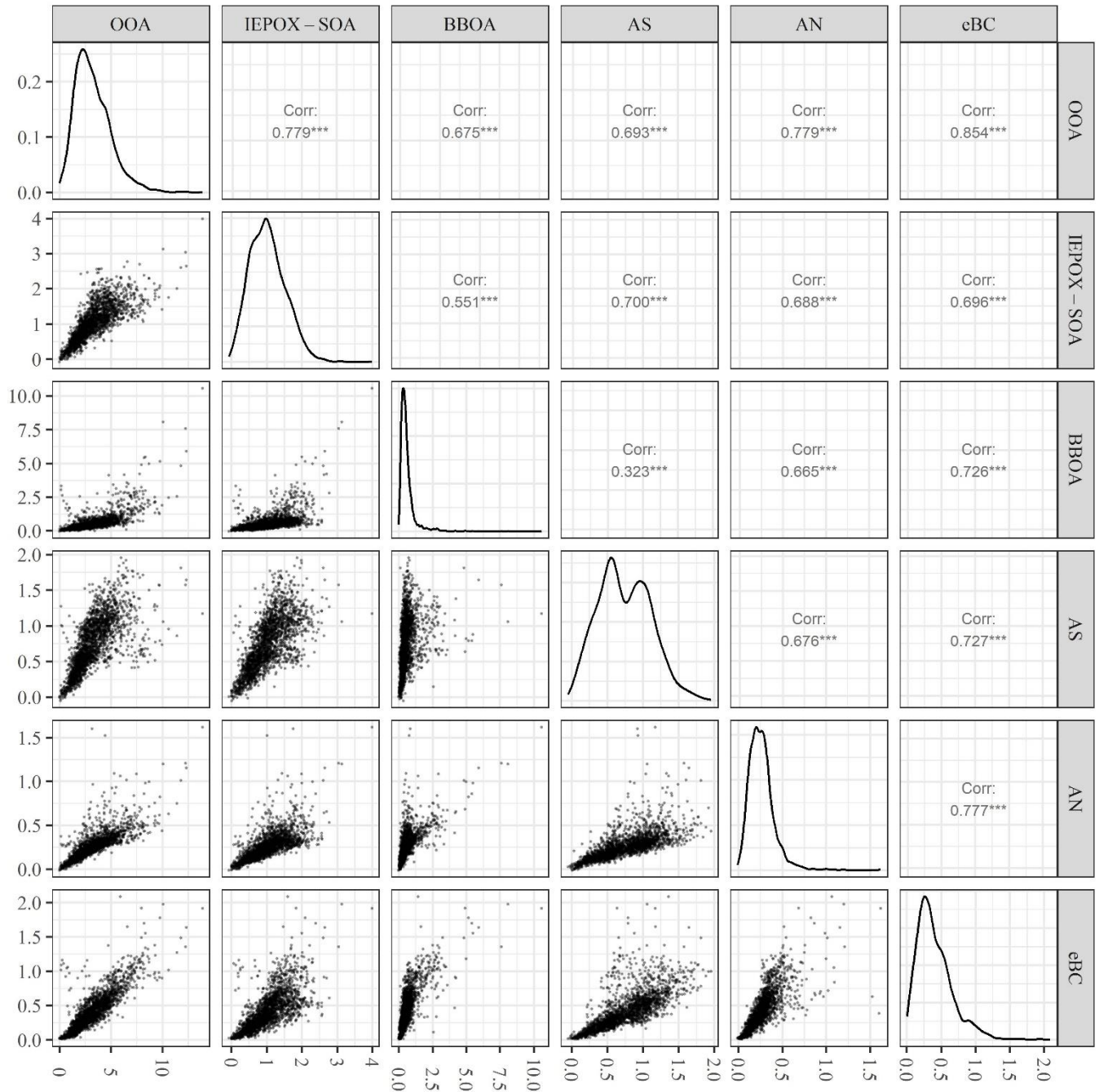



Figure S4.1 - Correlation matrix of all the aerosol species for a 3 factor solution based on 4 factors solution, with 2

62   combined. The numbers are the Pearson values, and the '***' means that p < 0.001.

63   **S4.2 - 3 factor solution:**

64

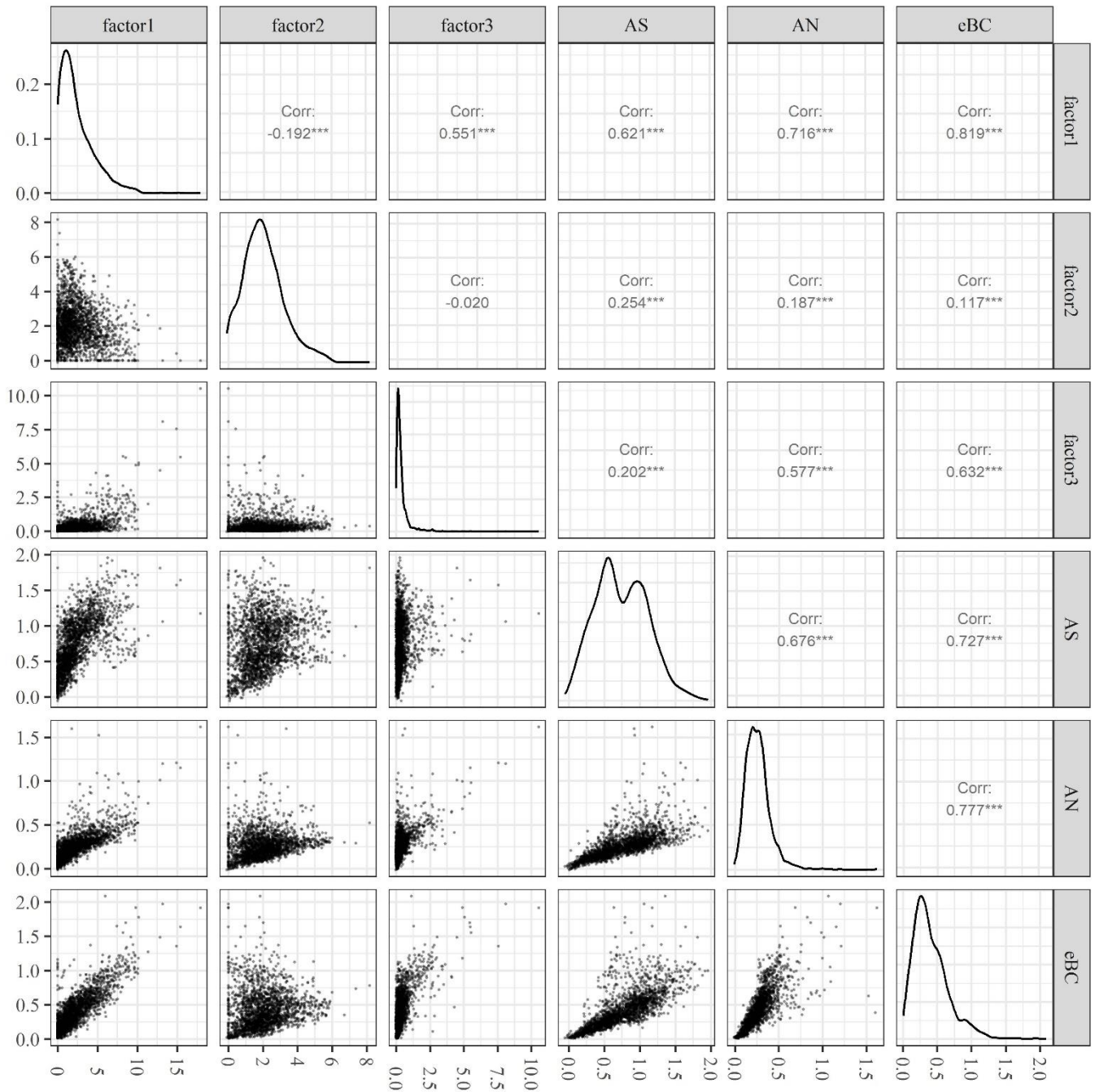
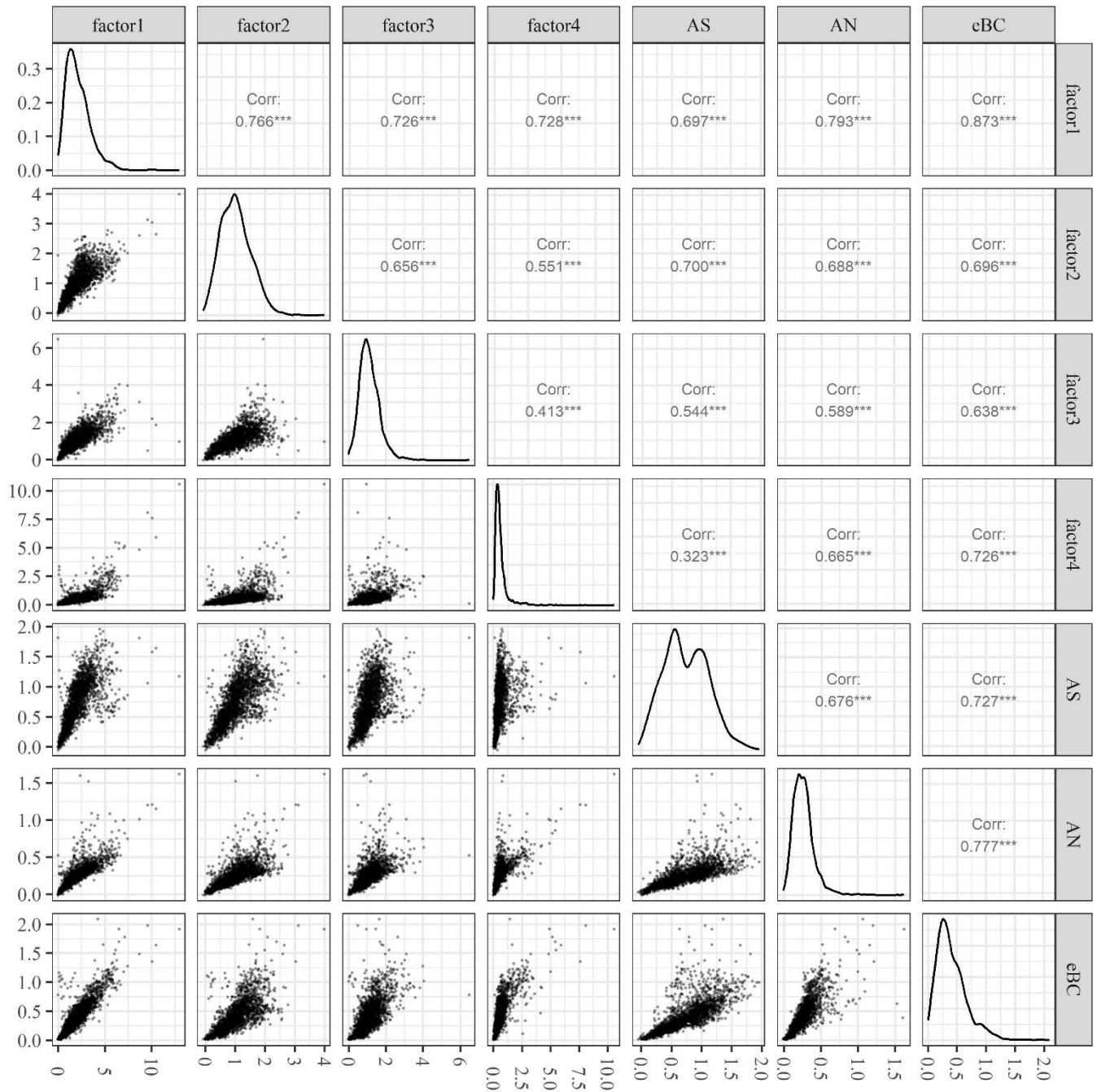



Figure S4.2 - Correlation matrix of all the aerosol species for a 3 factors solution. The numbers are the Pearson values, and the '***' means that p < 0.001.

S4.3 - 4 factor solution, factors 1 and 3 were combined to generate the combined 3 factors solution:

69 Figure S4.3 - Correlation matrix of all the aerosol species for a 4 factors solution. The numbers are the Pearson values, and

70 the '***' means that p < 0.001.

71

72 **S5 - Multi-linear regression model tests**

73 Table S5.1 - Testing the MLR without AN.

74

	MSE ($m^2 \, g^{-1}$)							
Wavelength (nm)	450	450 test	550	550 test	637	637 test	700	700 test
eBC	13.58±1.08	13.81±1.08	10.67±0.70	10.84±0.71	8.68±0.52	8.82±0.53	7.62±0.44	7.78±0.45
BBOA	7.96±0.33	8.49±0.31	5.33±0.21	5.72±0.20	3.83±0.16	4.16±0.15	3.10±0.13	3.40±0.13
IEPOX-SOA	5.61±0.41	5.76±0.41	3.84±0.27	3.95±0.27	2.87±0.20	2.97±0.20	2.37±0.17	2.43±0.17
OOA	3.58±0.15	3.74±0.15	1.94±0.10	2.05±0.10	1.24±0.07	1.34±0.07	0.90±0.06	0.99±0.06
AS	4.79±0.62	5.80±0.60	4.79±0.41	5.53±0.39	4.77±0.30	5.41±0.29	4.58±0.25	5.11±0.25
R^2	0.92	0.92	0.93	0.93	0.93	0.93	0.93	0.92

75

76

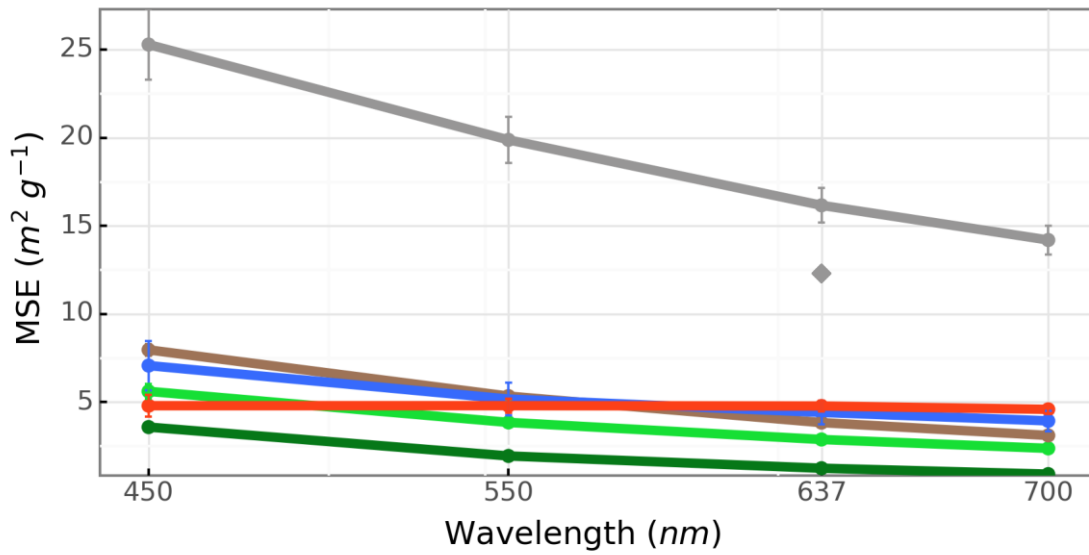
77 Table S5.2 - Mean of 100 tests using different randomly selected subsets of 50% of the data.

78

	MSE ($m^2 \, g^{-1}$)							
Wavelength (nm)	450	450 test	550	550 test	637	637 test	700	700 test
eBC	13.58±1.08	13.86±2.77	10.67±0.70	10.85±1.77	8.68±0.52	8.81±1.28	7.62±0.44	7.75±1.07
BBOA	7.96±0.33	7.90±1.07	5.33±0.21	5.28±0.74	3.83±0.16	3.79±0.56	3.10±0.13	3.07±0.47
IEPOX-SOA	5.61±0.41	5.49±0.56	3.84±0.27	3.76±0.37	2.87±0.20	2.81±0.27	2.37±0.17	2.30±0.23

OOA	3.58±0.15	3.56±0.31	1.94±0.10	1.92±0.22	1.24±0.07	1.23±0.16	0.90±0.06	0.89±0.14
AS	4.79±0.62	4.89±1.40	4.79±0.41	4.87±0.89	4.77±0.30	4.83±0.64	4.58±0.25	4.62±0.52
AN	7.07±1.41	7.14±2.20	5.17±0.92	5.26±1.51	4.41±0.68	4.50±1.20	3.93±0.58	4.01±1.05
R^2	0.92	0.92±0.01	0.93	0.93±0.01	0.93	0.93±0.01	0.93	0.93±0.01

79

80 **S6 – MSE for eBC MAC = 12.3 $m^2 g^{-1}$**

81

82

83 Figure S6 - Mass scattering efficiencies (MSE) for each chemical component at each wavelength, with mass absorption
84 cross-section values for eBC = 12.3 $m^2 g^{-1}$.

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