

Supplementary material for: Source apportionment of the summer time carbonaceous aerosol at Nordic rural background sites

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Contents

The supplementary material consists of:

- **Tables S1 – S4.** Tables S1–S4 provide the results of the LHS source-apportionment in terms of carbon contributions ($\mu\text{g C m}^{-3}$) to particulate total carbon (TCp, corrected for the positive artifact).
- **Tables S5 – S8.** These data are the same as those used in Tables S1–S4, except re-calculated in terms of percentage contributions to TCp.

Table S1: Calculated contributions to TCp ($\mu\text{g C m}^{-3}$) at Birkenes from LHS analysis, PM10, Summer. C.E. is central estimate (50th percentile), range is 10th-90th percentiles of LHS results.

	05.08-12.08		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.01	(0.00–0.01)	0.00	(0.00–0.00)	0.02	(0.01–0.02)	0.00	(0.00–0.00)
ECff	0.10	(0.07–0.15)	0.01	(0.01–0.02)	0.11	(0.08–0.15)	0.07	(0.07–0.08)
OCbb	0.02	(0.01–0.02)	0.01	(0.01–0.01)	0.05	(0.04–0.07)	0.01	(0.00–0.01)
OCfossil	0.09	(0.05–0.14)	0.04	(0.02–0.06)	0.10	(0.06–0.14)	0.03	(0.02–0.04)
BSOA	0.80	(0.67–0.92)	0.23	(0.14–0.32)	0.59	(0.48–0.69)	0.40	(0.34–0.46)
OCpbap	0.36	(0.26–0.48)	0.27	(0.19–0.36)	0.31	(0.23–0.40)	0.22	(0.17–0.28)
OCpbs	0.16	(0.12–0.20)	0.12	(0.08–0.15)	0.16	(0.11–0.20)	0.09	(0.06–0.11)
OCpbc	0.20	(0.11–0.32)	0.16	(0.08–0.25)	0.15	(0.08–0.24)	0.13	(0.08–0.20)

Table S2: Contributions to TCp ($\mu\text{g C m}^{-3}$), Hyttiälä, as Table S1.

	02.09-09.09		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.02	(0.01–0.02)	0.01	(0.01–0.01)	0.01	(0.01–0.02)	0.01	(0.01–0.02)
ECff	0.10	(0.06–0.15)	0.03	(0.01–0.04)	0.05	(0.03–0.08)	0.08	(0.05–0.12)
OCbb	0.07	(0.04–0.08)	0.03	(0.02–0.03)	0.05	(0.03–0.06)	0.05	(0.03–0.06)
OCfossil	0.12	(0.05–0.18)	0.05	(0.02–0.08)	0.08	(0.04–0.13)	0.10	(0.05–0.15)
BSOA	1.45	(1.23–1.66)	0.65	(0.53–0.77)	0.86	(0.72–0.98)	0.95	(0.80–1.10)
OCpbap	0.67	(0.48–0.88)	0.41	(0.30–0.53)	0.39	(0.28–0.50)	0.46	(0.33–0.59)
OCpbs	0.32	(0.23–0.40)	0.22	(0.16–0.27)	0.20	(0.14–0.25)	0.24	(0.17–0.30)
OCpbc	0.35	(0.19–0.56)	0.19	(0.10–0.30)	0.19	(0.10–0.30)	0.22	(0.12–0.35)

Table S3: Contributions to TCp ($\mu\text{g C m}^{-3}$), Lille Valby, as Table S1.

	05.08-12.08		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.03	(0.02–0.04)	0.01	(0.01–0.02)	0.03	(0.02–0.04)	0.04	(0.03–0.05)
ECff	0.29	(0.18–0.41)	0.12	(0.09–0.17)	0.23	(0.16–0.32)	0.22	(0.14–0.32)
OCbb	0.12	(0.07–0.14)	0.05	(0.03–0.06)	0.11	(0.07–0.13)	0.14	(0.10–0.17)
OCfossil	0.36	(0.19–0.55)	0.11	(0.07–0.16)	0.22	(0.13–0.30)	0.23	(0.14–0.31)
BSOA	3.58	(3.18–3.95)	0.51	(0.38–0.62)	0.83	(0.69–0.96)	0.60	(0.47–0.72)
OCpbap	0.83	(0.54–1.20)	0.33	(0.22–0.45)	0.33	(0.22–0.46)	0.27	(0.18–0.38)
OCpbs	0.22	(0.16–0.28)	0.12	(0.08–0.15)	0.11	(0.08–0.14)	0.09	(0.06–0.11)
OCpbc	0.61	(0.32–0.98)	0.21	(0.11–0.33)	0.22	(0.12–0.35)	0.18	(0.10–0.29)

Table S4: Contributions to total carbon ($\mu\text{g C m}^{-3}$), Vavihill, as Table S1.

	05.08-12.08		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.01	(0.01–0.02)	0.01	(0.01–0.02)	0.03	(0.01–0.03)	0.02	(0.01–0.02)
ECff	0.16	(0.11–0.23)	0.09	(0.07–0.12)	0.18	(0.15–0.23)	0.15	(0.13–0.18)
OCbb	0.05	(0.03–0.06)	0.05	(0.03–0.06)	0.09	(0.06–0.10)	0.06	(0.04–0.07)
OCfossil	0.14	(0.08–0.22)	0.07	(0.04–0.10)	0.13	(0.08–0.18)	0.09	(0.05–0.12)
BSOA	1.28	(1.14–1.41)	0.34	(0.24–0.42)	0.88	(0.78–0.98)	0.69	(0.60–0.77)
OCpbap	0.33	(0.23–0.45)	0.26	(0.18–0.34)	0.23	(0.16–0.32)	0.20	(0.14–0.28)
OCpbs	0.14	(0.10–0.18)	0.11	(0.08–0.14)	0.09	(0.07–0.12)	0.07	(0.05–0.09)
OCpbc	0.19	(0.10–0.31)	0.15	(0.08–0.23)	0.14	(0.08–0.23)	0.13	(0.07–0.21)

Table S5: Calculated percentage contributions to TCp at Lille Valby from LHS analysis, PM10, Summer. C.E. is central estimate (50th percentile), range is 10th-90th percentiles of LHS results.

	05.08-12.08		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.60	(0.4-0.8)	1.30	(0.8-1.6)	1.8	(1.1-2.3)	2.7	(1.7-3.5)
ECff	5.6	(3-7)	11	(7-15)	13	(9-18)	15	(9-21)
OCbb	2.2	(1.4-2.7)	4.4	(2-5)	6.2	(4-7)	9.40	(6-11)
OCfossil	6.9	(3-10)	10	(6-14)	12	(7-17)	15	(9-20)
BSOA	69	(60-75)	45	(33-54)	48	(39-55)	40	(31-47)
OCpbap	16	(10-22)	29	(19-39)	19	(12-26)	18	(12-25)
OCpbs	4.2	(3-5)	10	(7-13)	6.3	(4-8)	5.9	(4-7)
OCpbc	12	(6-18)	18	(9-29)	13	(6-20)	12	(6-19)

Table S6: Percentage contributions, Birkenes, as Table S5.

	05.08-12.08		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.40	(0.2-0.5)	0.50	(0.3-0.6)	1.3	(0.8-1.7)	0.30	(0.1-0.3)
ECff	7.4	(5-10)	2.4	(1.3-3.2)	9.5	(6-13)	10	(9-11)
OCbb	1.4	(0.9-1.6)	1.7	(1.1-2.0)	4.6	(3-5)	1.0	(0.6-1.2)
OCfossil	6.4	(3-10)	7.0	(3-11)	8.3	(4-12)	4.1	(2-5)
BSOA	58	(48-66)	41	(23-55)	50	(40-58)	55	(46-62)
OCpbap	26	(18-35)	48	(33-64)	26	(19-34)	30	(23-37)
OCpbs	12	(8-14)	20	(14-25)	14	(9-17)	12	(8-14)
OCpbc	15	(7-23)	28	(14-44)	13	(6-20)	18	(10-27)

Table S7: Percentage contributions, Vavihill, as Table S5.

	05.08-12.08		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.70	(0.4-0.9)	1.7	(1.1-2.1)	1.6	(1.0-2.0)	1.4	(0.8-1.7)
ECff	8.1	(5-11)	11	(9-14)	12	(9-14)	13	(10-15)
OCbb	2.5	(1.6-3.0)	5.8	(3-6)	5.6	(3-6)	4.7	(3-5)
OCfossil	7.3	(4-11)	8.7	(5-12)	8.5	(5-11)	7.2	(4-10)
BSOA	65	(57-71)	41	(29-51)	57	(50-63)	57	(49-64)
OCpbap	17	(11-22)	31	(22-41)	15	(10-20)	17	(11-23)
OCpbs	7.0	(5-8)	13	(9-17)	5.9	(4-7)	6.2	(4-7)
OCpbc	9.6	(5-15)	18	(9-28)	9.2	(5-14)	11	(5-17)

Table S8: Percentage contributions, Hyttiälä, as Table S5.

	02.09-09.09		12.08-19.08		19.08-26.08		26.08-02.09	
	C.E.	Range	C.E.	Range	C.E.	Range	C.E.	Range
ECbb	0.80	(0.5-1.0)	0.70	(0.4-0.9)	1.0	(0.6-1.2)	0.90	(0.5-1.1)
ECff	4.3	(2-6)	2.4	(1.3-3.4)	3.7	(2-5)	4.8	(2-7)
OCbb	2.7	(1.8-3.3)	2.4	(1.6-2.9)	3.4	(2.2-4.1)	3.1	(2.0-3.7)
OCfossil	4.8	(2-7)	4.1	(1-6)	5.6	(2-9)	5.9	(2-9)
BSOA	60	(50-68)	56	(45-65)	60	(50-67)	58	(48-66)
OCpbap	28	(19-36)	35	(25-44)	27	(19-35)	28	(20-35)
OCpbs	13	(9-16)	19	(13-23)	14	(9-17)	15	(10-18)
OCpbc	14	(7-23)	16	(8-25)	13	(7-21)	13	(7-21)