Supplementary Information

Seasonal source variability of carbonaceous aerosols at the Rwanda climate Observatory

August Andersson[1], Elena N Kirillova[1,2], Stefano Decesari[2], Langley DeWitt[3], Jimmy Gasore[3,4,5], Katherine E Potter[3], Ronald G Prinn[3], Maheswar Rupakheti[6], Jean de Dieu Ndikubwimana[4], Julius Nkusi[4], Bonfils Safari[5].

[1] Department of Environmental Science and Analytical Chemistry (ACES) and the Bolin Centre for Climate Research, Stockholm University, SE-10691 Stockholm, Sweden

[2] Institute of Atmospheric Sciences and Climate-ISAC, National Research Council of Italy, Bologna, Italy

[3] Center for Global Change Science, Massachusetts Institute of Technology, Cambridge, MA, USA

[4] Climate Secretariat, Ministry of Education, Kigali, Rwanda

[5] Physics Department, School of Science, College of Science and Technology, University of Rwanda, Kigali, Rwanda

[6] Institute for Advanced Sustainability Studies (IASS), Potsdam, Germany

Correspondence: August Andersson (august.andersson@aces.su.se)

Table S1. Concentrations (μg m^{-3}; μgC m^{-3} for carbonaceous components) and carbon isotope signatures (‰) of TC in $PM_{2.5}$ at RCO during October 2014 to September 2015. Sampling occurred between 01.00 AM and 06.00 AM C.A.T.

Start	Stop	TC	OC	EC	WSOC	NO_3^-	SO_4^{2-}	NH_4^+	K^+	$\Delta^{14}C_{TC}$	$\delta^{13}C_{TC}$
2014-10-01	2014-10-07	2.76	2.46	0.30	1.90	0.15	0.98	0.37	0.17	-19	-23.6
2014-10-08	2014-10-14	2.80	2.50	0.30	1.55	0.12	0.68	0.23	0.15	N/A	N/A
2014-10-22	2014-10-29	1.58	1.41	0.16	0.93	0.01	0.58	0.19	0.08	-44	-24.0
2014-11-05	2014-11-18	1.03	0.93	0.10	0.56	0.01	0.51	0.15	0.03	-84*	-26.1*
2014-11-19	2014-11-25	1.43	1.28	0.15	1.32	0.01	0.57	0.19	0.04	-84*	-26.1*
2015-04-25	2015-05-01	2.61	2.42	0.19	1.42	0.07	0.80	0.24	0.06	-24	-27.3
2015-05-02	2015-05-08	1.51	1.41	0.11	0.98	0.05	0.29	0.13	0.03	N/A	N/A
2015-05-09	2015-05-15	1.89	1.77	0.12	1.20	0.09	0.27	0.14	0.04	-3	-25.8
2015-05-16	2015-05-22	3.45	3.23	0.22	2.25	0.27	1.02	0.37	0.08	N/A	N/A
2015-05-23	2015-05-29	4.99	4.63	0.36	2.79	0.32	1.22	0.49	0.15	+9	-23
2015-05-30	2015-06-05	4.31	3.99	0.32	2.53	0.19	2.08	0.60	0.22	N/A	N/A
2015-06-06	2015-06-12	4.63	4.16	0.47	3.17	0.67	0.80	0.41	0.27	+18	-21.7
2015-06-13	2015-06-19	9.89	9.06	0.83	6.76	0.61	4.99	1.33	0.78	N/A	N/A
2015-06-20	2015-06-26	10.05	8.67	1.38	6.15	1.30	2.63	1.02	0.72	N/A	N/A
2015-06-27	2015-07-03	11.01	9.24	1.77	7.02	1.76	2.22	1.03	0.81	N/A	N/A
2015-07-04	2015-07-10	9.27	7.93	1.34	5.22	1.27	1.55	0.68	0.65	+25	-21.3
2015-07-11	2015-07-17	11.21	9.29	1.92	6.84	1.64	1.53	0.66	0.83	N/A	N/A
2015-07-18	2015-07-24	13.73	11.77	1.97	8.45	2.12	2.33	1.02	1.02	+30	-22.4
2015-07-25	2015-07-31	17.00	14.84	2.16	9.44	2.48	2.43	1.11	1.18	N/A	N/A
2015-08-01	2015-08-07	12.00	10.24	1.77	6.97	1.81	2.42	0.80	1.01	+26	-22.4
2015-08-08	2015-08-10	8.50	6.82	1.68	4.80	1.59	1.14	0.59	0.26	N/A	N/A
2015-08-11	2015-08-17	7.63	6.37	1.26	4.87	0.91	1.47	0.60	0.59	+19	-22.8
2015-08-19	2015-08-24	12.63	11.52	1.48	7.11	1.46	1.48	0.64	0.68	N/A	N/A
2015-09-01	2015-09-07	3.59	3.24	0.35	2.25	0.17	1.79	0.52	0.31	-25	-23.3
2015-09-08	2015-09-14	7.43	6.44	0.99	4.25	0.53	1.83	0.48	0.48	N/A	N/A

* two filters were combined for isotope analysis.

Table S2. Dual carbon isotope constrained fractions (f, in %) and concentrations of TC (μgC m^{-3}) from the three main sources: C_3-plants, C_4 and fossil at RCO during October 2014 to September 2015.

Start	Stop	f_{C3}	f_{fossil}	f_{C4}	TC_{C3}	TC_{fossil}	TC_{C4}
2014-10-01	2014-10-07	48±6	12±3	40±6	1.32±0.17	0.33±0.08	1.10±0.17
2014-10-22	2014-10-29	48±6	14±3	38±6	0.76±0.09	0.22±0.05	0.60±0.09
2014-11-05	2014-11-25	50±6	18±3	32±6	0.62±0.07	0.22±0.04	0.39±0.07
2015-04-25	2015-05-01	57±6	12±3	31±6	1.49±0.16	0.31±0.08	0.81±0.16
2015-05-09	2015-05-15	54±6	11±3	36±6	1.02±0.11	0.21±0.06	0.68±0.11
2015-05-23	2015-05-29	49±6	9±3	42±6	2.44±0.30	0.45±0.15	2.10±0.30
2015-06-06	2015-06-12	47±6	9±3	45±6	2.18±0.28	0.42±0.14	2.08±0.28
2015-07-04	2015-07-10	46±6	8±3	46±6	4.26±0.55	0.74±0.28	4.26±0.56
2015-07-18	2015-07-24	49±6	8±3	44±6	6.72±0.82	1.1±0.41	6.04±0.82
2015-08-01	2015-08-07	49±6	8±3	44±6	5.88±0.72	0.96±0.36	5.28±0.72
2015-08-11	2015-08-17	49±6	9±3	43±6	3.74±0.46	0.69±0.23	3.28±0.46
2015-09-01	2015-09-07	47±6	13±3	40±6	1.69±0.22	0.47±0.11	1.44±0.22