



Supplement of

Long-range transport of air pollutants increases the concentration of hazardous components of PM_{2.5} in northern South America

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Figure content

- Figure S1.** Average magnitudes of OM-AOD (a.), Du-AOD (b.), and TCSO₂ (c.) concentration around the events. Different colors represent different anomalies. The shadowed region delimits the event.²
- Figure S2.** OM-AOD, Du-AOD and TCSO₂ time series and event periods for (a) BB-LRT, (b) Dust-LRT and (c) Volcanic-LRT along with chemical sampling days for the selected events. 2
- Figure S3.** PMF's Factor profiles for the models run for the set of sampling days for (a) BB aerosols, (b) dust and (c) volcanic aerosols. 4
- Figure S4.** Factor contribution for BB, dust, and volcanic emissions factors identified in the PMF models for BB-LRT, Dust-LRT, and Volcanic-LRT 5

Tables content

- Table S1.** PM_{2.5} average concentration (ug/m³) and percentage of exceedance of daily WHO [RP1] (15 ug/m³) and national (37 ug/m³) standards for urban stations from the Aburrá Valley's official air quality network during the study period..... 1
- Table S2.** Median magnitudes in ng/m³ of the concentration of PM_{2.5} chemical compounds during the study period and during and around (before and after) the identified events of BB-LRT, Dust-LRT and Volcanic-LRT. The ratio OC/EC and SOC/OC are also included, these are dimensionless. 3

Table S1. PM_{2.5} average concentration (ug/m³) and percentage of exceedance of daily WHO (15 ug/m³) and national (37 ug/m³) standards for urban stations from [the Aburrá Valley's official air quality network](#) during the study period

Official AQ Station	2019			2020			2021			2022		
	Average	% WHO	% National	Average	% WHO	% National	Average	% WHO	% National	Average	% WHO	% National
CEN-TRAF	28.6	99.2	14.2	25.5	87.2	10.9	25.0	97.0	1.9	26.7	98.6	5.5
ENV-HOSP	17.5	54.0	3.0	16.8	41.0	6.8	14.3	39.2	0.3	15.3	46.0	0.5
EST-HOSP	18.8	63.3	4.4	17.2	45.1	5.7	14.8	43.8	0.3	15.7	50.4	0.5
ITA-CJUS	23.4	91.5	6.8	22.7	79.0	10.7	20.8	87.7	1.4	23.7	90.7	4.9
ITA-CONC	18.5	66.3	2.7	19.6	64.2	6.8	16.6	61.4	0.3	16.7	47.1	0.3
MED-ALTA	22.7	92.6	5.2	19.9	69.7	6.0	18.6	79.7	0.5	19.4	81.6	1.1
MED-ARAN	22.2	86.0	7.4	20.1	62.8	9.6	17.8	68.2	0.5	19.3	77.8	0.5
MED-BEME	21.7	83.0	4.7	19.5	64.2	7.1	19.9	78.1	0.5	20.2	82.5	0.5
MED-LAYE	19.2	71.5	2.2	17.7	50.3	5.5	17.1	65.2	0.3	17.7	61.9	1.4
MED-TESO	17.2	54.0	3.3	16.8	42.3	6.8	14.9	45.8	0.3	15.7	50.1	1.1
MED-VILL	18.9	66.8	3.8	18.4	53.8	6.8	16.2	57.0	0.8	17.4	63.6	0.3
SAB-RAME	18.5	63.0	3.3	17.8	50.8	6.8	15.6	50.4	0.3	17.4	63.8	0.8

Note: this table includes the official air quality stations in the most urbanized zone of the Aburrá Valley. The MED-BEME site corresponds to the location of the chemical sampling campaign (shadowed row).

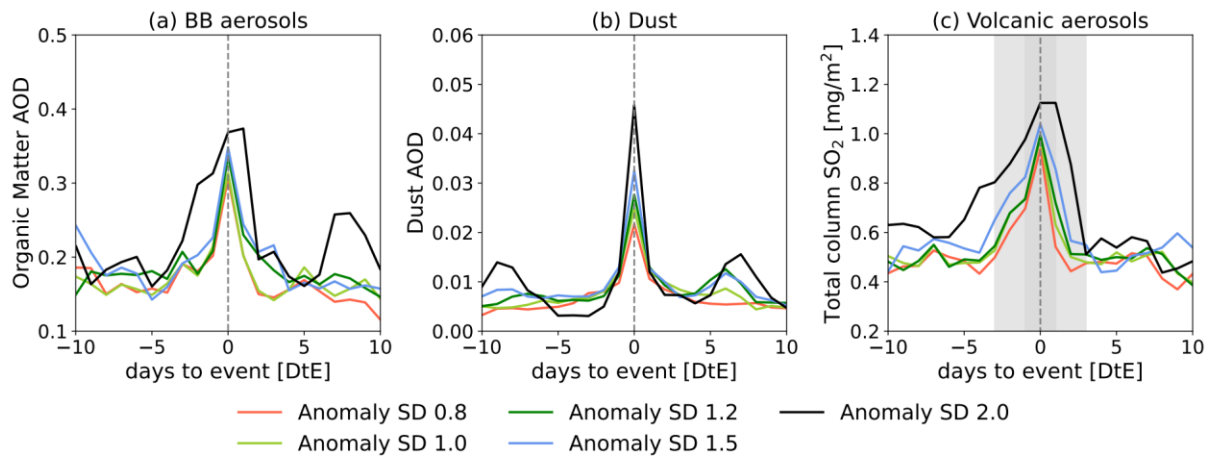


Figure S1. Average magnitudes of OM-AOD (a.), Du-AOD (b.), and TCSO₂ (c.) concentration around the events. Different colors represent different anomalies. The shadowed region delimits the event.

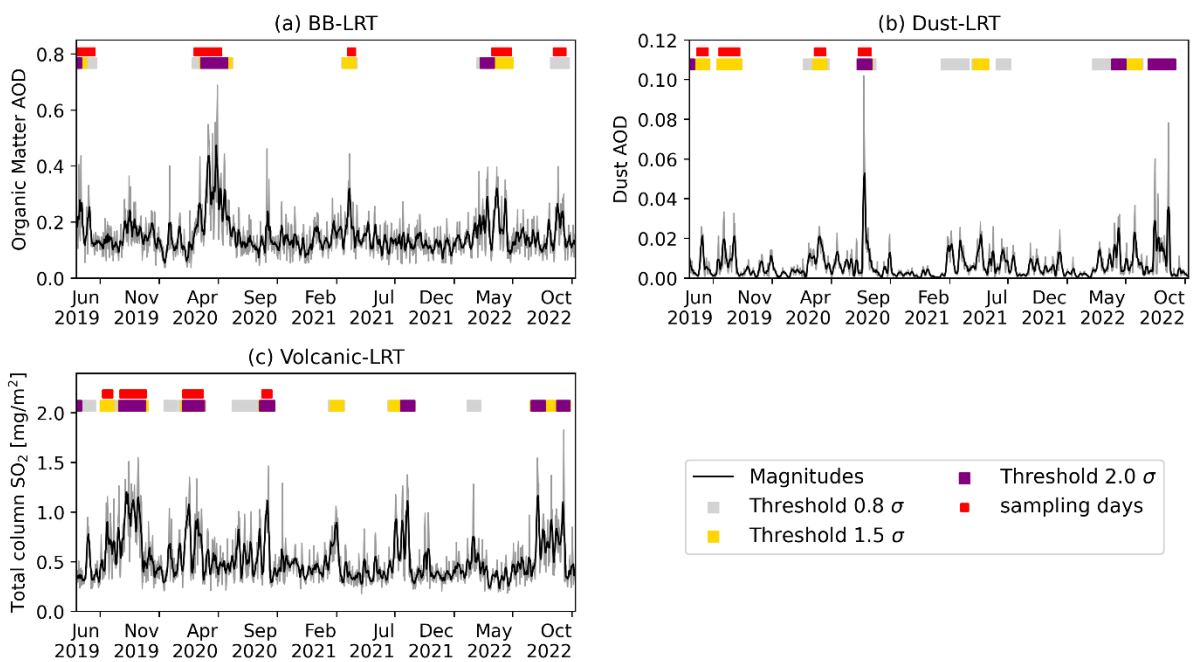


Figure S2. OM-AOD, Du-AOD and TCSO₂ time series and event periods for (a) BB-LRT, (b) Dust-LRT and (c) Volcanic-LRT along with chemical sampling days for the selected events.

Table S2. Median magnitudes in ng/m³ of the concentration of PM_{2.5} chemical compounds during the study period and during and around (before and after) the identified events of BB-LRT, Dust-LRT and Volcanic-LRT. The ratio OC/EC and SOC/OC are also included, these are dimensionless.

	Median	Median BB-LRT	Median Around BB-LRT	Median Dust-LRT	Median Around Dust-LRT	Median Volcanic-LRT	Median Around Volcanic-LRT
Be	0.01	0.02	0.01	0.01	0.02	0.01	0.01
Na	202.69	331.22	101.71	11.69	221.57	539.06	194.07
Mg	77.04	109.44	64.61	78.81	81.64	112.55	85.34
Al	445.42	542.72	318.58	525.32	414.15	671.58	450.85
Si	231.83	282.48	165.82	273.42	215.55	349.54	234.66
K	240.44	256.3	233.41	289.36	207.07	210.85	203.13
Ca	259.26	313.05	187.94	262.92	259.26	416.02	257.21
Ti	18.34	25.99	14.82	24.2	20.51	31.27	18.93
V	1.26	1.39	0.85	1.44	1.29	1.83	1.34
Cr	1.46	1.67	0.87	1.47	1.47	2.3	1.37
Mn	3.97	4.64	3.45	4.44	4.05	5.76	3.8
Fe	210.14	285.44	139.29	285.44	239.16	346.95	234.13
Co	0.21	0.17	0.14	0.23	0.19	0.25	0.23
Ni	1.79	1.71	1.58	2	1.63	2.67	1.9
Cu	6.83	6.62	6.94	4.38	5.37	5.18	3.93
Zn	24.65	29.25	25.76	19.4	22.86	26.76	20.31
As	0.98	0.7	1	0.77	0.9	0.62	0.77
Se	0.56	0	0.74	0.37	0.66	0.77	0.61
Mo	0.29	0.26	0.3	0.2	0.23	0.24	0.19
Ag	0.02	0.01	0.04	0.02	0.01	0.02	0.01
Cd	0.13	0.18	0.11	0.08	0.15	0.13	0.14
Sb	0.79	0.62	0.75	0.74	0.83	0.8	0.8
Ba	11.5	13.3	10.96	10.71	10.16	17.66	10.88
Hg	0.08	0.04	0.08	0.05	0.08	0.1	0.08
Pb	3.31	2.71	3.11	2.81	3.67	3.19	3.16
Fluoride	13.29	34.04	10.8	27.58	22.39	14.01	19.72
Chloride	71.75	253.53	149.07	96.1	186.56	101.93	103.37
Nitrate	400.79	529.11	595.34	394.31	441.75	384.72	396.03
Sulphate	1376.4	2790.83	1899.46	1826.07	1472.98	1096.26	1474.96
Potassium	88.76	118.94	111.8	96.88	87.13	134.67	37.2
magnesium	10.55	13.74	11.97	11.92	12.15	8.51	9.49
Calcium	24.97	31.52	27	30.79	29.96	19.93	21.76
Sodium	164.6	124.84	22.62	134.06	267.04	322.77	125.08
C	6269.62	10191.5	6902.07	6661.92	7437.02	8214.57	6440.68
OC	5568.07	9249.99	5978.83	5762.34	6728.79	7375.77	5719.63
EC	694	778.54	782.29	778.54	729.04	724.98	696.7
OC1	1162.73	2001.79	1237.05	1101.18	1320.94	1352.2	1115.57
OC2	1217.86	2286.4	1247.75	1217.86	1444.06	1495.25	1218.81
OC3	470.91	764.49	481.52	498.86	581.24	599.19	470.99

OC4	725.17	1221.59	806.68	807.4	945.4	886.61	759.74
OC5	9.53	13.12	11.01	14.16	17.58	20.42	11.16
PyC	1902.34	3231.61	1982.31	1855.19	2001.91	2703.61	2105.51
EC1	277.01	453.57	284.18	271.09	251.99	324.86	303.31
EC2	1383.02	2080.26	1041.19	1183.03	1130.96	1454.13	1632.26
EC3	652.09	778.04	766.96	1030.82	1013.25	915.21	751.53
EC4	88.97	77.92	97.08	233.35	185.49	150.8	103.67
EC5	17.29	22.44	18.85	20.16	20.42	19.9	16.87
EC6	18.34	24.83	19.2	20.56	19.43	20.68	15.97
OC/EC	7.84	11.29	7.21	7.71	7.76	9.51	8.13
SOC	1871.01	5034.98	1085.18	3064.9	3064.06	2928.61	2429.04
SOC/OC	0.34	0.54	0.2	0.46	0.41	0.46	0.39

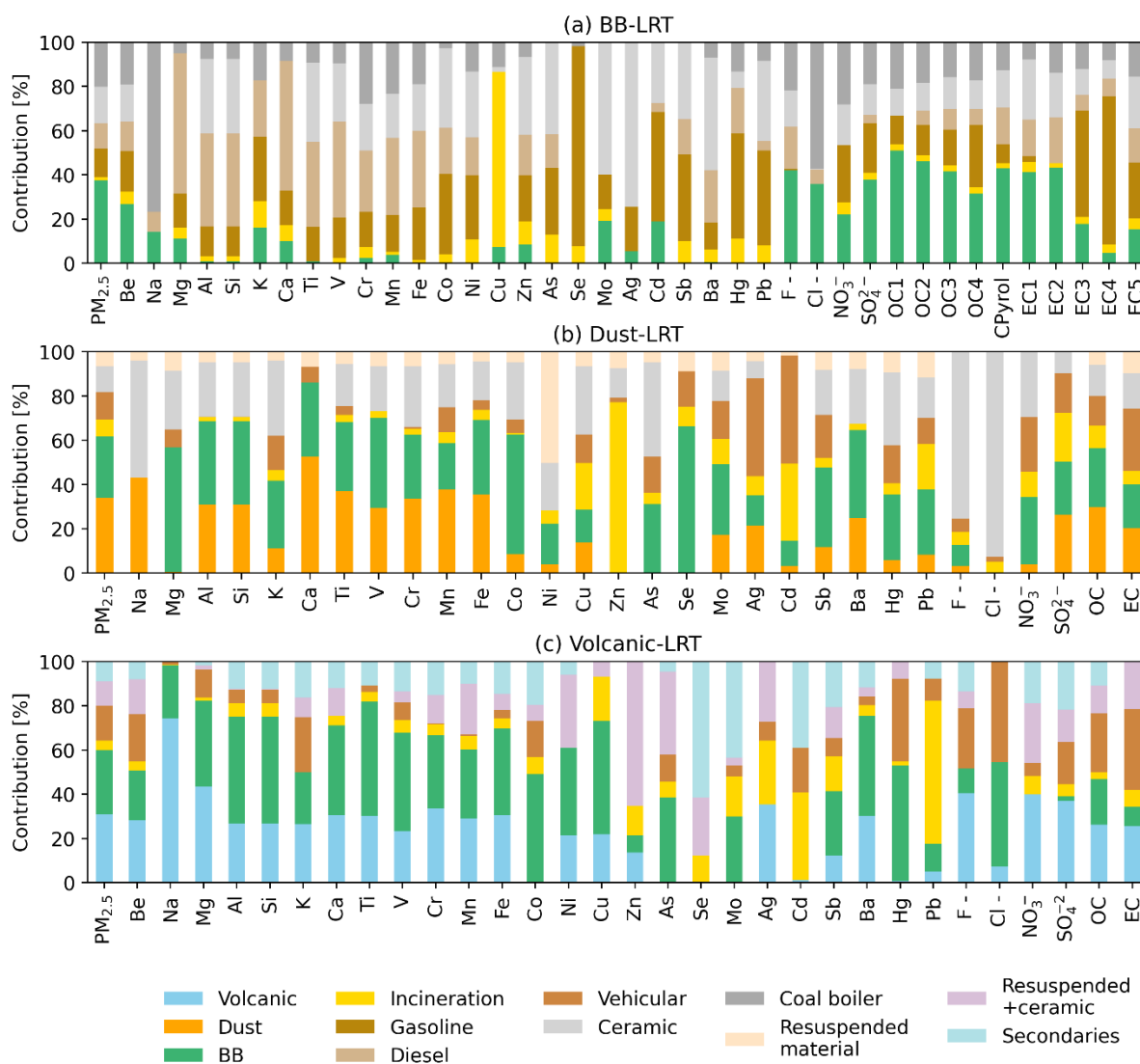


Figure S3. PMF's Factor profiles for the models run for the set of sampling days for (a) BB aerosols, (b) dust and (c) volcanic aerosols.

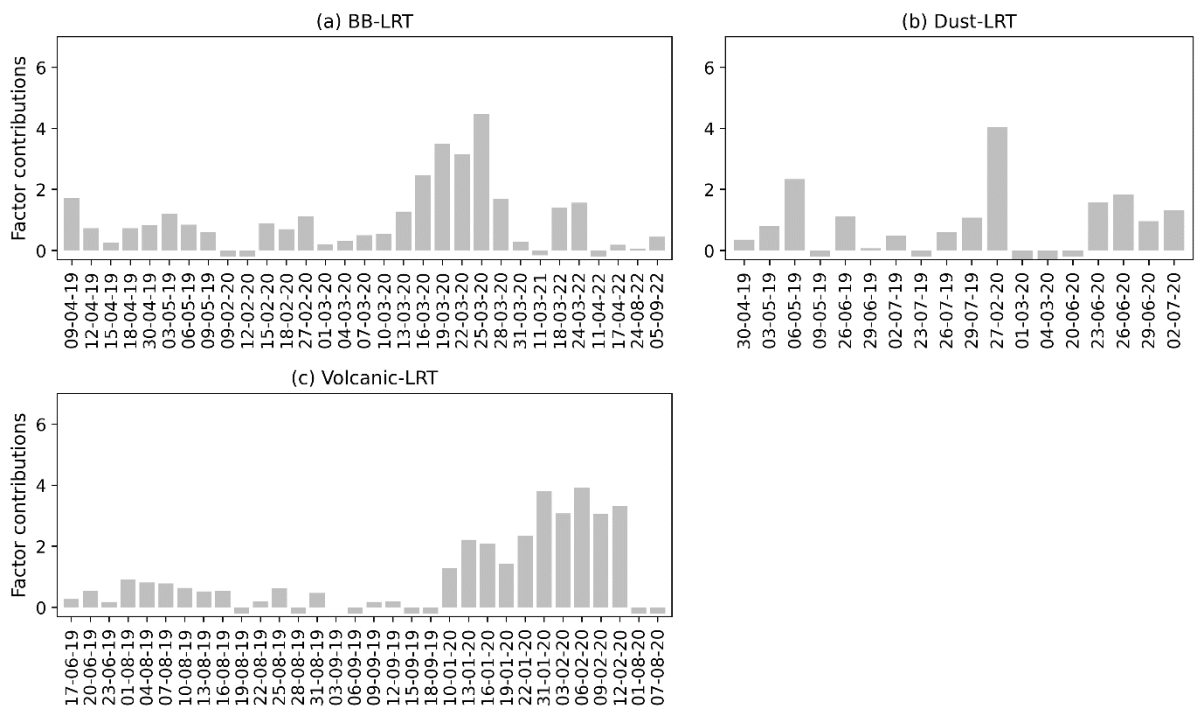


Figure S4. Factor contribution for BB, dust, and volcanic emissions factors identified in the PMF models for BB-LRT, Dust-LRT, and Volcanic-LRT