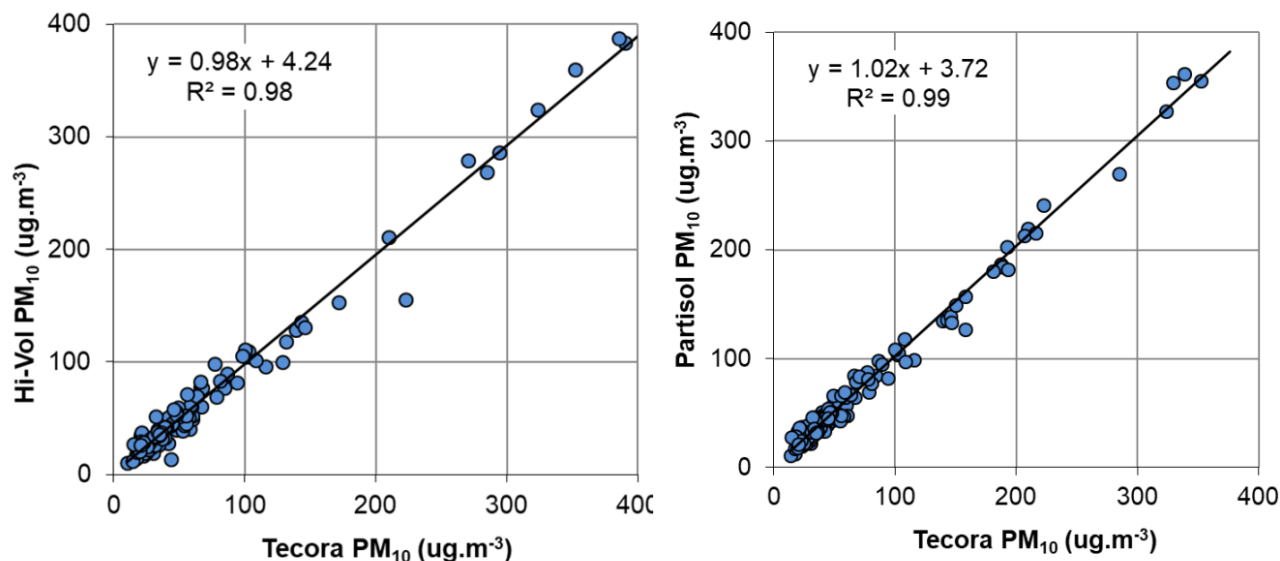
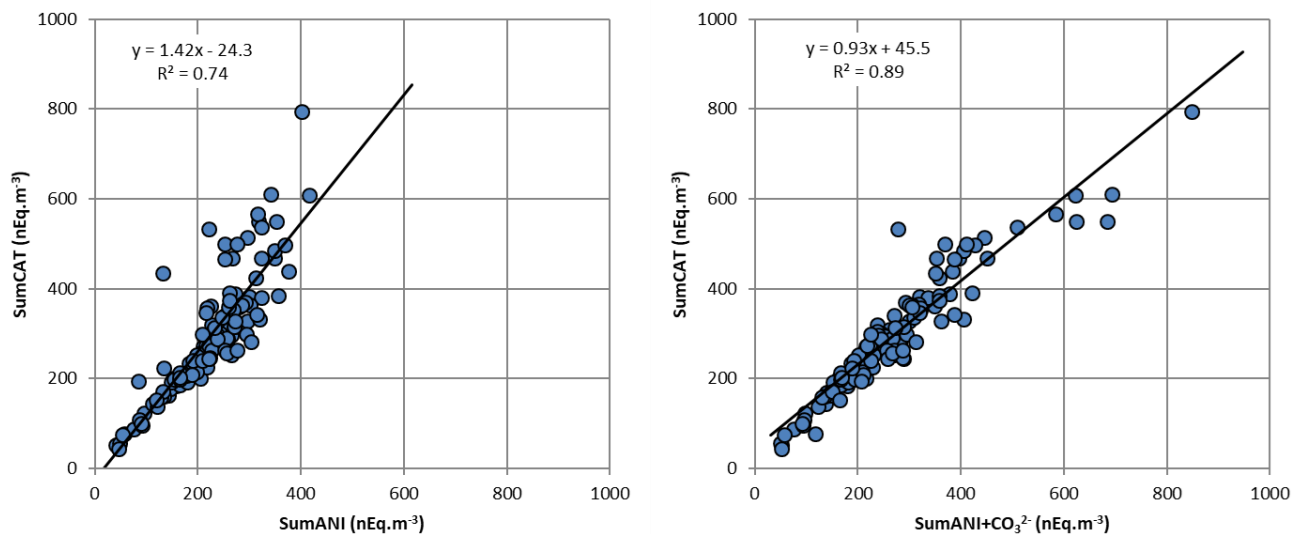


SUPPLEMENT



5 **Figure S1: Comparison between PM₁₀ concentration values, in atmospheric aerosol parallel sampling with Nuclepore (Tecora), Teflon (Partisol) and Quartz (Hi-Vol) filters.**



10 **Figure S2: Ion balance between total analysed cations and anions, without and with the inclusion of measured carbonates (ANI- anions; CAT- cations).**

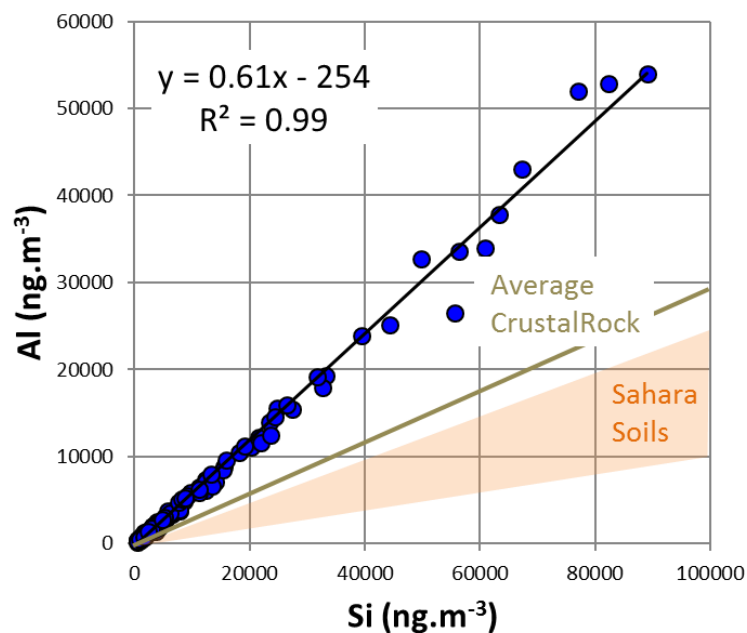


Figure S3: Relation between Si and Al concentrations in atmospheric aerosols. Also shown Al/Si ratio ranges, in Sahara, and average value for global soils, taken from Moreno et al., (2006), and Manson and Moore, (1982), respectively.

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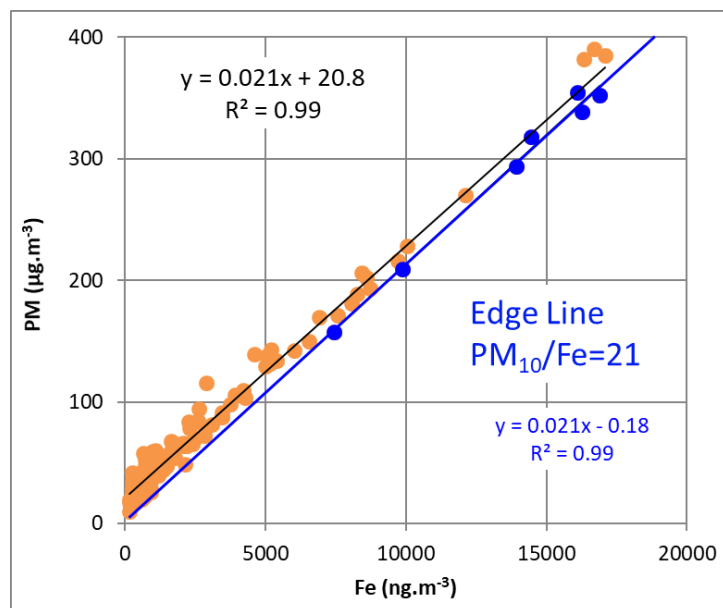


Figure S4: Relation between Fe and PM₁₀ concentrations. The blue line is the low edge representing, approximately, the amount of dust in PM₁₀. Edge lines are best-fit linear lines traced through points in blue.

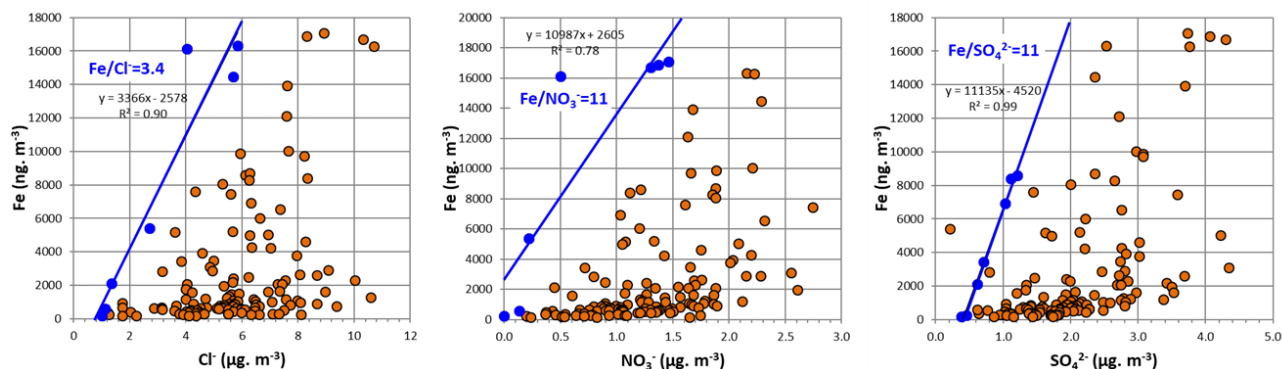


Figure S5: Edge lines for chloride, nitrate and sulphate, representing, coarsely, the amount of these anions in soil dust. Edge lines are best-fit linear lines traced through points in blue.

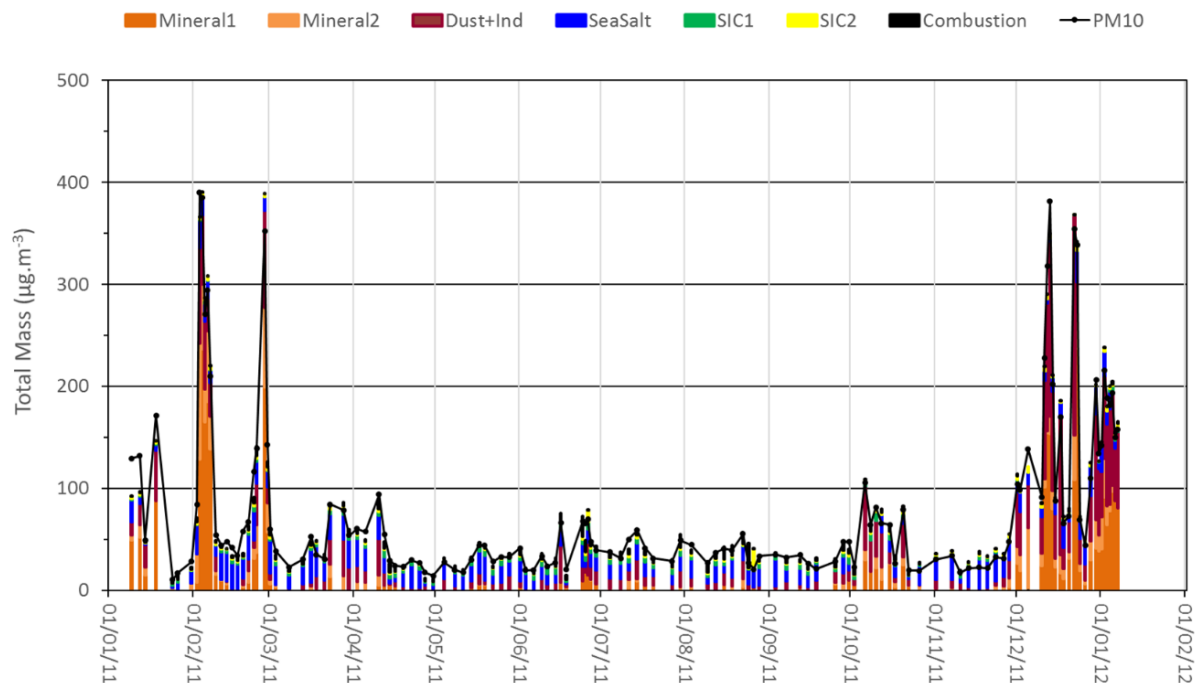


Figure S6: Source contributions for individual sampling events, calculated with PMF.

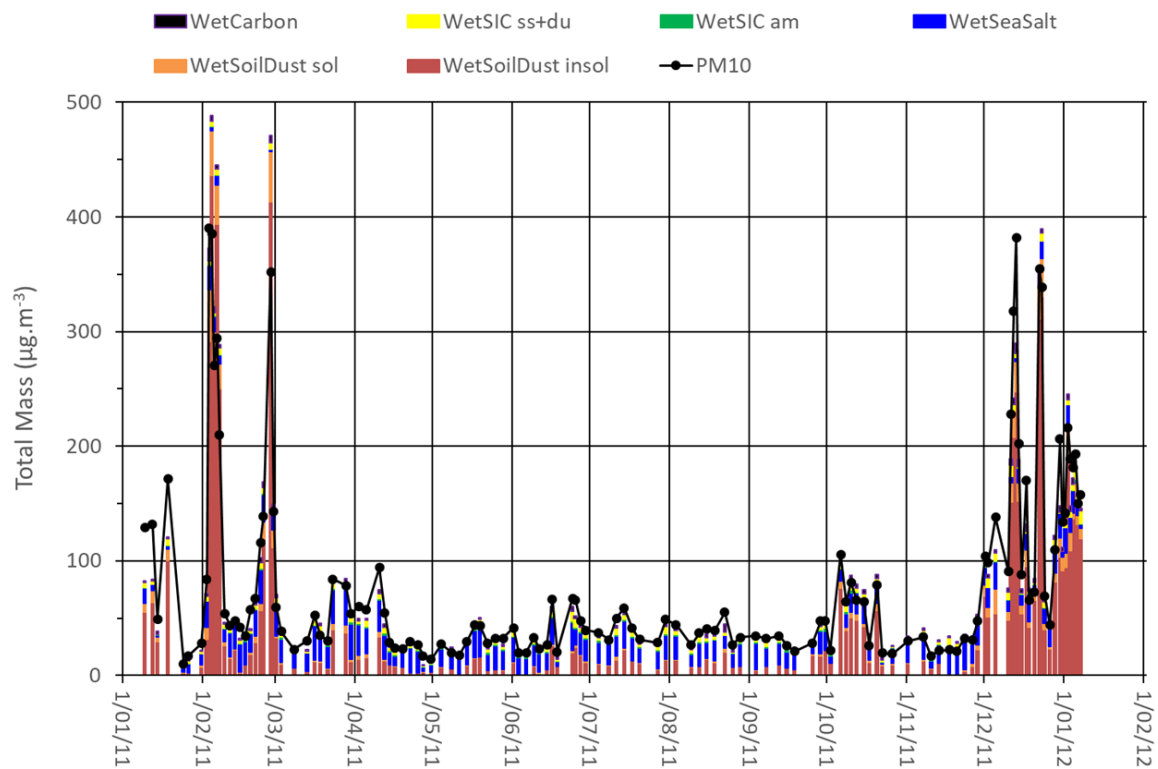


Figure S7: Source contributions for individual sampling events, calculated with the IMB methodology.

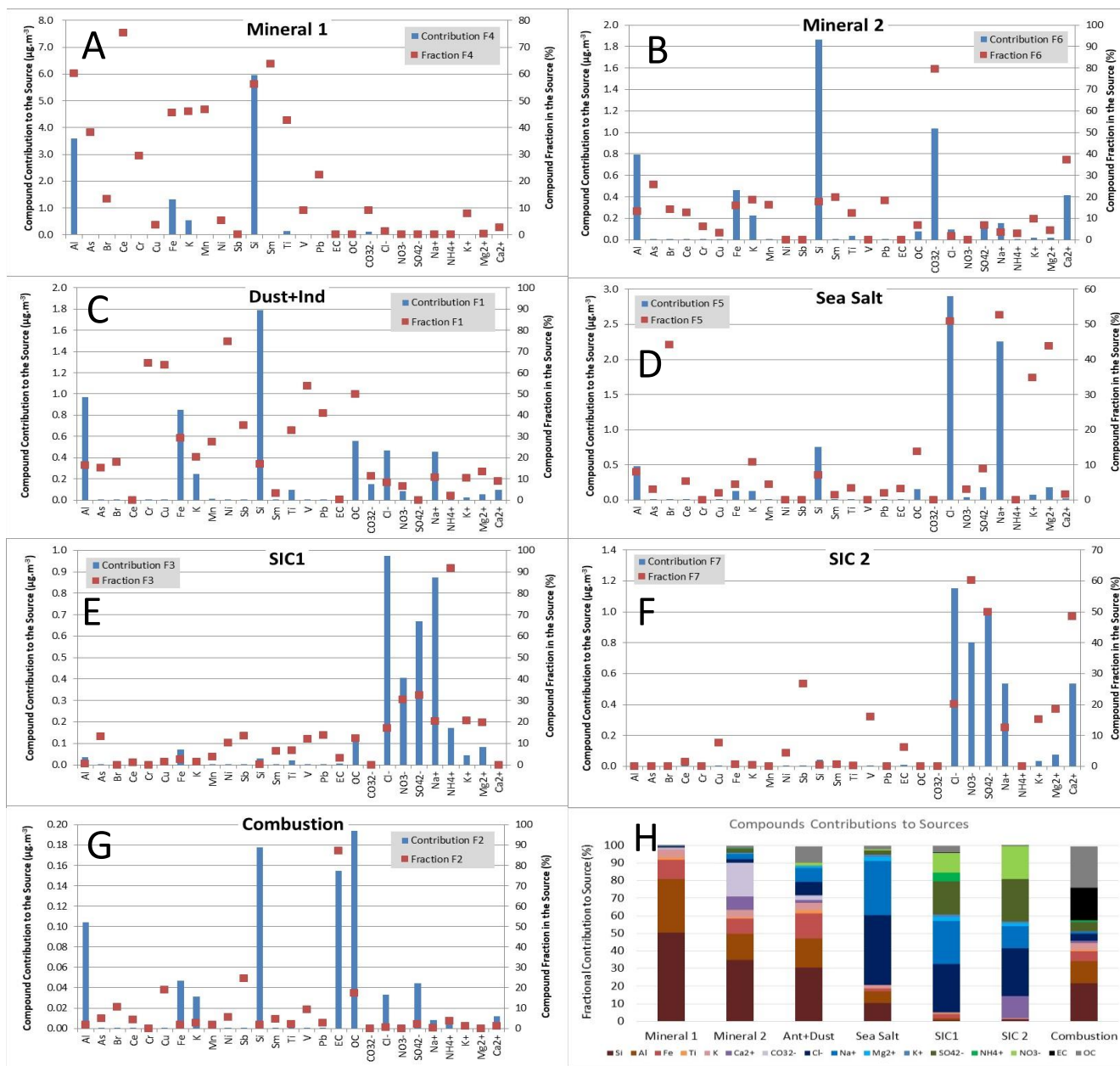


Figure S8: PMF Source Contributions and Profiles for the seven identified factors (Graphs A-G). Graph H presents the fraction contribution of each main compound to each source.

Table S1: Concentrations of major elemental species (as oxides) at nine sites in Sahara region, according to Moreno et al., (2006), and average crustal levels taken from Manson and Moore, (1982). The table presents also the estimation of factor F used in Equation 3.

	CrustalAver	Hoggar Massif		Chad Basin		Niger		Western Sahara			Sahara Average
		HM1	HM2	CB1	CB2	MON	HAR	WS1	WS2	WS3	
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
SiO ₂	59.3	62.1	62.5	63.2	70.2	69.5	66.7	49.4	46.2	56.8	60.7
TiO ₂	0.7	1.4	1.2	1.0	1.2	1.4	1.2	0.6	0.4	0.9	1.0
Al ₂ O ₃	15.4	14.7	13.6	14.0	11.7	11.6	12.2	8.8	7.0	5.1	11.0
Fe ₂ O ₃	7.2	6.1	5.2	6.7	4.7	4.4	5.7	4.4	2.8	4.2	4.9
MnO	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
MgO	3.5	1.8	1.6	1.2	0.8	0.5	0.9	2.9	2.6	1.9	1.6
CaO	5.1	2.4	2.0	1.4	1.4	0.4	1.6	12.9	17.7	12.2	5.8
K ₂ O	3.1	2.5	2.5	1.5	1.5	1.2	1.8	1.9	1.7	1.4	1.8
SUM	94.4	91.0	88.6	89.0	91.5	88.9	90.1	80.9	78.5	82.6	86.8
Na ₂ O	3.8	1.6	1.9	1.1	0.5	0.4	0.6	0.9	0.7	0.8	0.9
P ₂ O ₅	3.1	2.5	2.5	1.5	1.5	1.2	1.8	1.9	1.7	1.4	1.8
SO ₃	0.1	0.2	0.2	0.3	0.2	0.0	0.1	0.1	0.1	0.1	0.1
TOTAL	98.5	93.1	91.0	90.6	92.3	89.4	91.0	82.2	79.7	83.9	88.1

F=100/86.8= 1.15