



## Supplement of

## First insights into northern Africa high-altitude background aerosol chemical composition and source influences

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Figure S1. Cluster analysis of back trajectories arriving at AMV site from August to December 2017 classified into 4 trajectory clusters.



Figure S2. Back trajectory calculated at 1267 m above ground level and 2000 m above sea level.



**Figure S3.** Frequency distribution and corresponding probability density function of PM<sub>10</sub> mass and wind speed during the sampling period.



**Figure S4.** (A) Typical background chemical composition average at AMV station (10 samples); (B) n-alkanes; (C) Polycyclic aromatic hydrocarbons (PAHs); (D) n-alkan-2-ones; identified compounds.



Figure S5. Correlation between OC and EC concentration at the AMV site according to each air mass; The black line represent the linear.



Figure S6. Correlation between anions and cations concentration (in equivalent); data corresponds to the concentrations measured at AMV for the study period.



Figure S7. Correlation between nss-SO<sub>4</sub><sup>2-</sup> and nss-Ca<sup>2+</sup> during Saharan dust (SD) air mass.



**Figure S8.** Average concentration of organic identified compounds at AMV station according to air masses for; (A) n-alkanes; (B) Polycyclic aromatic hydrocarbons (PAHs; (C) n-alkan-2-ones (PAHs); (D) sugars.

	20	S	Na⁺	Ŀ	NO <sup>3-</sup>	nss-SO4 <sup>2-</sup>	NH₄⁺	c <sub>2</sub> 04 <sup>2-</sup>	n-alkanes	nss-Mg <sup>2+</sup>	nss-K⁺	nss-Ca <sup>2+</sup>			
ос	1.00	0.50	0.63	0.38	0.67	0.73	0.54	0.88	0.88	0.73	0.61	0.72			
EC	0.50	1.00	0.40	0.07	0.51	0.44	0.49	0.52	0.50	0.39	0.60	0.14		1	.0
Na⁺	0.63	0.40	1.00	0.76	0.77	0.67	0.45	0.74	0.52	0.37	0.25	0.32			
CI	0.38	0.07	0.76	1.00	0.46	0.34	0.13	0.39	0.32	0.18	0.13	0.25	-	- 0.	.8
NO <sub>3</sub> -	0.67	0.51	0.77	0.46	1.00	0.77	0.77	0.82	0.56	0.47	0.46	0.42			
nss-SO42-	0.73	0.44	0.67	0.34	0.77	1.00	0.79	0.84	0.64	0.62	0.51	0.60		- 0.	.6
NH4 <sup>+</sup>	0.54	0.49	0.45	0.13	0.77	0.79	1.00	0.65	0.49	0.33	0.36	0.26		- 0	.4
C <sub>2</sub> O <sub>4</sub> <sup>2-</sup>	0.88	0.52	0.74	0.39	0.82	0.84	0.65	1.00	0.75	0.66	0.57	0.61			
n-alkanes	0.88	0.50	0.52	0.32	0.56	0.64	0.49	0.75	1.00	0.68	0.55	0.63	-	- 0.	.2
nss-Mg <sup>2+</sup>	0.73	0.39	0.37	0.18	0.47	0.62	0.33	0.66	0.68	1.00	0.66	0.84			
nss-K⁺	0.61	0.60	0.25	0.13	0.46	0.51	0.36	0.57	0.55	0.66	1.00	0.61		0	
nss-Ca <sup>2+</sup>	0.72	0.14	0.32	0.25	0.42	0.60	0.26	0.61	0.63	0.84	0.61	1.00			

Figure S9. Correlation matrix plot for various compound and elements.

	20	C <sub>23</sub> H <sub>48</sub>	C <sub>24</sub> H50	C <sub>25</sub> H <sub>52</sub>	C <sub>26</sub> H <sub>54</sub>	C <sub>27</sub> H <sub>56</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>31</sub> H <sub>64</sub>	C <sub>3</sub> H <sub>6</sub>		
ос	1.00	0.67	0.70	0.70	0.71	0.80	0.85	0.73	0.64		
C <sub>23</sub> H <sub>48</sub>	0.67	1.00	0.94	0.86	0.59	0.64	0.55	0.24	0.36		1.0
C <sub>24</sub> H <sub>50</sub>	0.70	0.94	1.00	0.96	0.72	0.76	0.62	0.32	0.36	-	- 0.8
C <sub>25</sub> H <sub>52</sub>	0.70	0.86	0.96	1.00	0.75	0.83	0.70	0.45	0.33		0.6
C <sub>26</sub> H <sub>54</sub>	0.71	0.59	0.72	0.75	1.00	0.89	0.77	0.67	0.59		0.6
C <sub>27</sub> H <sub>56</sub>	0.80	0.64	0.76	0.83	0.89	1.00	0.93	0.77	0.82	-	- 0.4
C <sub>29</sub> H <sub>60</sub>	0.85	0.55	0.62	0.70	0.77	0.93	1.00	0.87	0.90		0.2
C <sub>31</sub> H <sub>64</sub>	0.73	0.24	0.32	0.45	0.67	0.77	0.87	1.00	0.93		
C <sub>33</sub> H <sub>68</sub>	0.64	0.36	0.36	0.33	0.59	0.82	0.90	0.93	1.00		0

Figure S10. Correlation between measured concentrations of OC and organic compounds.



Figure S12. Wind rose plot during day and night-time from August to December 2017 at AMV.