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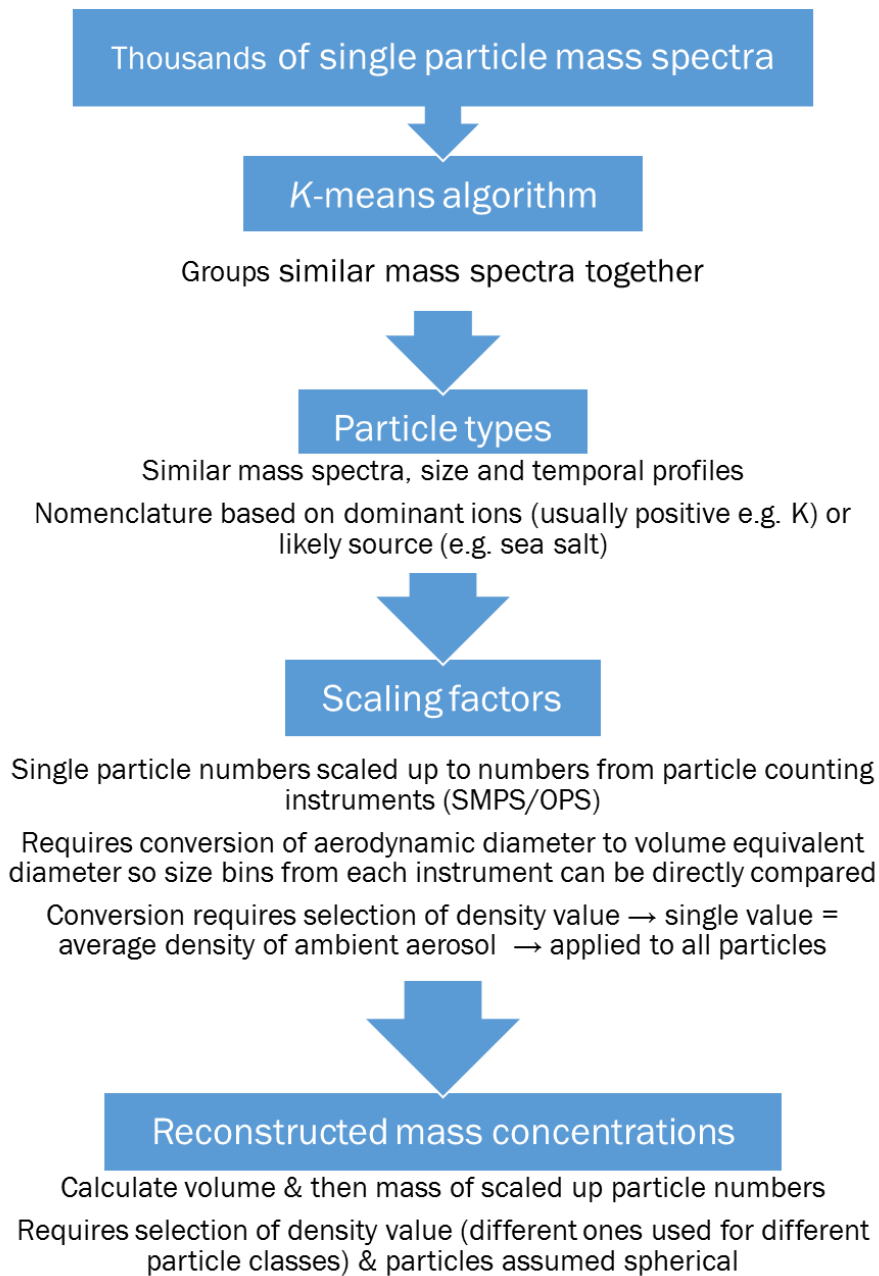
*Supplement of*

## **Sources and mixing state of summertime background aerosol in the north-western Mediterranean basin**

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**Figure 1. Schematic overview of ATOFMS data analysis.**

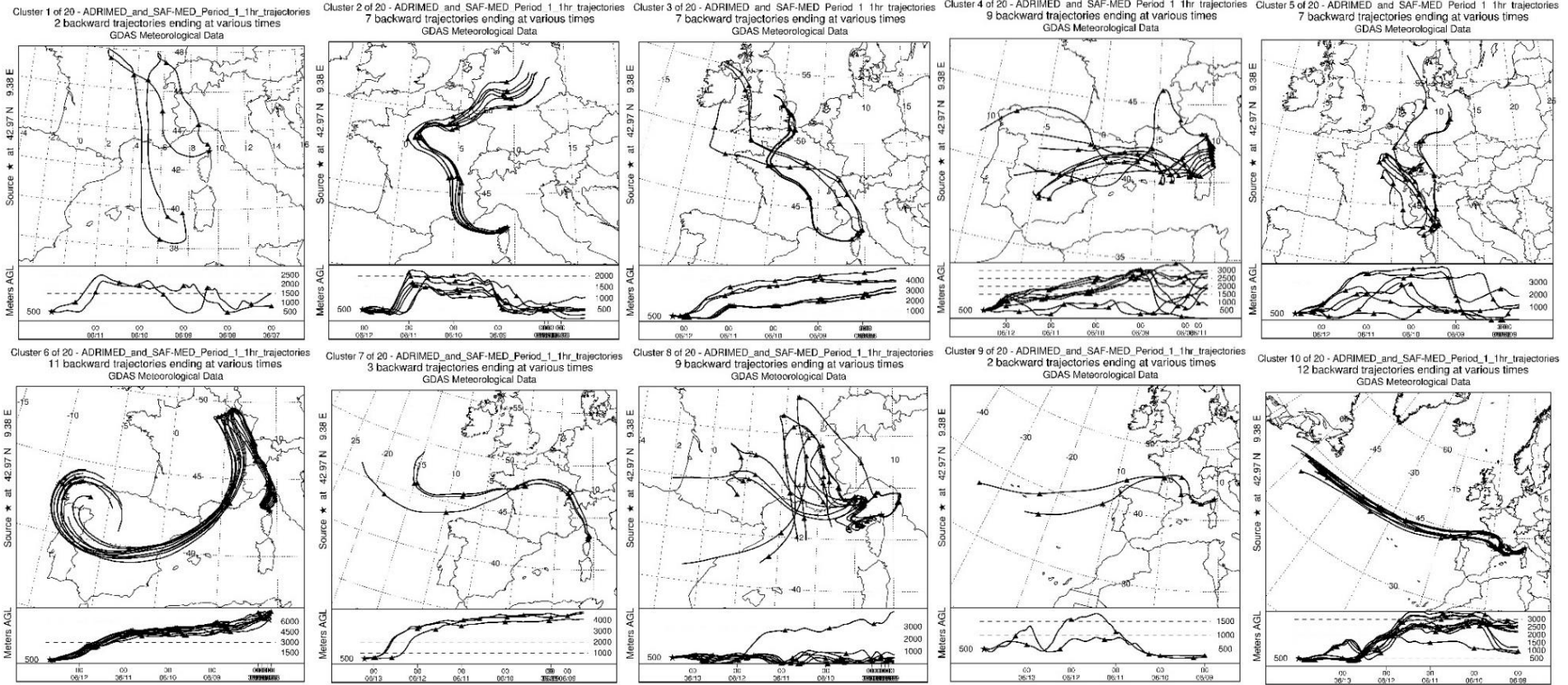
**Table 1. Pearson's correlation coefficient ( $R^2$ ) between mass concentrations from ATOFMS ( $PM_{2.5}$ ), TEOM ( $PM_{10}$  &  $PM_1$ ), ACSM ( $PM_1$ ), PILS ( $PM_{10}$ ) and MAAP ( $PM_{2.5}$ ) measurements and OPS number concentrations ( $\#/cm^3$ ) for the full sampling period, and during specific periods.**

$R^2$	ATOFMS total	ATOFMS EC-rich	ATOFMS K-rich	$PM_{10}$	$PM_1$	BC	ACSM total	ACSM $SO_4^{2-}$	ACSM $NH_4^+$	ACSM SV-OOA	ACSM LV-OOA	PILS-IC $SO_4^{2-}$	PILS-IC $NH_4^+$	OPS 0.3-0.579 $\mu m$ particles	*PILS Oxalate	*WSOC	**ATOFMS fresh sea salt	** PILS SSA	**OPS 0.579-2.156 $\mu m$ particles	*** PILS MSA	*** ACSM $NO_3^-$	*** PILS $NO_3^-$	
ATOFMS total	1																						
ATOFMS EC-rich	0.73	1																					
ATOFMS K-rich	0.48	0.28	1																				
$PM_{10}$	0.21	0.20	0.09	1																			
$PM_1$	0.44	0.46	0.30	0.17	1																		
BC	0.55	0.50	0.37	0.19	0.40	1																	
ACSM total	0.72	0.66	0.46	0.17	0.54	0.70	1																
ACSM $SO_4^{2-}$	0.66	0.61	0.38	0.14	0.46	0.48	0.81	1															
ACSM $NH_4^+$	0.65	0.62	0.37	0.12	0.44	0.47	0.81	0.93	1														
ACSM SV-OOA	0.46	0.43	0.35	0.11	0.38	0.57	0.69	0.33	0.32	1													
ACSM LV-OOA	0.59	0.59	0.46	0.17	0.50	0.67	0.88	0.61	0.61	0.63	1												
PILS-IC $SO_4^{2-}$	0.58	0.52	0.25	0.12	0.41	0.41	0.61	0.81	0.75	0.21	0.42	1											
PILS-IC $NH_4^+$	0.44	0.43	0.23	0.08	0.30	0.30	0.46	0.53	0.53	0.18	0.33	0.68	1										
OPS 0.3-0.579 $\mu m$ particles	0.73	0.69	0.49	0.24	0.54	0.57	0.82	0.71	0.70	0.54	0.75	0.60	0.46	1									
*PILS Oxalate	0.35	0.41	0.25	0.14	0.36	0.37	0.50	0.28	0.29	0.41	0.54	0.27	0.23	0.42	1								
*WSOC	0.44	0.37	0.29	0.24	0.42	0.46	0.50	0.19	0.18	0.60	0.58	0.19	0.09	0.44	0.55	1							
**ATOFMS fresh sea salt	0.04	0.07	0.05	0.04	0.02	0.04	0.12	0.07	0.05	0.15	0.16	0.06	0.18	0.02	0.01	N/A	1						
**PILS SSA	0.11	0.01	0.02	0.35	0.00	0.00	0.09	0.05	0.06	0.13	0.17	0.02	0.25	0.01	0.04	N/A	0.81	1					
**OPS 0.579-2.156 $\mu m$ particles	0.42	0.03	0.02	0.24	0.03	0.01	0.01	0.00	0.00	0.03	0.07	0.01	0.08	0.03	0.00	N/A	0.81	0.88	1				
***PILS MSA	0.18	0.19	0.06	0.05	0.16	0.06	0.21	0.35	0.37	0.001	0.17	0.48	0.54	0.20	0.08	0.03	0.06	0.00	0.02	1			
***ACSM $NO_3^-$	0.58	0.53	0.34	0.25	0.54	0.41	0.75	0.71	0.75	0.35	0.66	0.75	0.55	0.65	0.35	0.28	0.05	0.02	0.04	0.46	1		
***PILS $NO_3^-$	0.07	0.06	0.02	0.10	0.04	0.00	0.04	0.13	0.14	0.02	0.03	0.34	0.33	0.13	0.15	0.00	0.01	0.24	0.36	0.53	0.20	1	

\*Correlations calculated from 21<sup>st</sup> June-4<sup>th</sup> August.

\*\*Correlations calculated from 20-27<sup>th</sup> June.

\*\*\*Correlations calculated from 23<sup>rd</sup> July-5<sup>th</sup> August



**Figure 2. Individual HYSPLIT120-hour back trajectories for each cluster for Period 1 during ADRIMED and SAF-MED.**

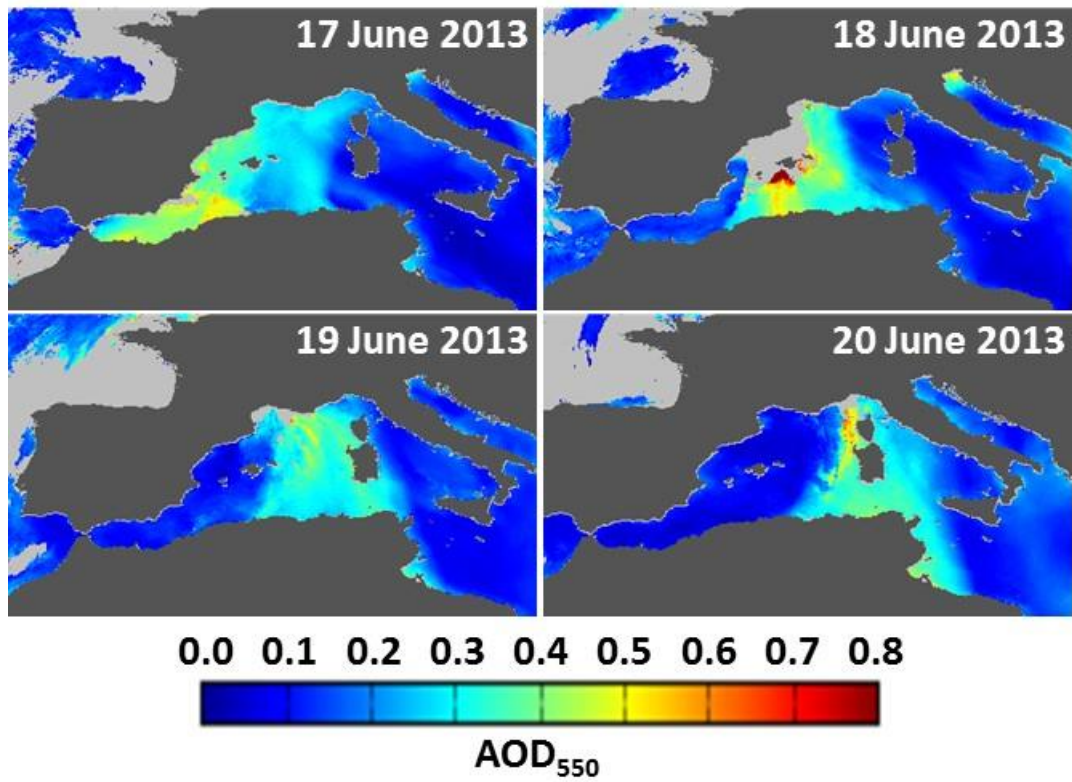


Figure 3. Daytime average aerosol optical depth at 550 nm ( $AOD_{550}$ ) derived from MSG/SEVIRI (Thieuleux et al., 2005) from 17th to 20th June 2013 showing a dust plume transport over the western Mediterranean basin (produced by <http://www.icare.univ-lille1.fr>). Land and cloudy pixels in dark and light grey, respectively.

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