Supplemental Information

Is there an aerosol signature of cloud processing?

Barbara Ervens[1,2], Armin Sorooshian[3,4], Abdulmonam M. Aldhaif[3], Taylor Shingler[5,6], Ewan Crosbie[5,6], Luke Ziemba[6], Pedro Campuzano-Jost[2,7], Jose L. Jimenez[2,7], Armin Wisthaler[8,9]

[1] NOAA/ESRL/Chemical Sciences Division, Boulder, CO, USA
[2] CIRES, University of Colorado, Boulder, CO, USA
[3] Department of Chemical and Environmental Engineering, University of Arizona, Tucson, AZ, USA
[4] Department of Hydrology and Atmospheric Sciences, University of Arizona, Tucson, AZ, USA
[5] Science Systems and Applications, Inc., Hampton, VA, USA
[6] NASA Langley Research Center, Hampton, VA, USA
[7] Department of Chemistry and Biochemistry, University of Colorado, Boulder, Colorado, USA
[8] Department of Chemistry, University of Oslo, Oslo, Norway
[9] Institute for Ion Physics and Applied Physics, University of Innsbruck, Innsbruck, Austria

Correspondence to: barbara.ervens@noaa.gov and armin@email.arizona.edu

_____

This supplemental information includes:

Table S1: Initial gas phase mixing ratios [ppb] used as input for the box and parcel models. Data are from SEACR[4]S for six different air masses.

Figure S1: Predicted relative mass concentration increase due to cloud processing in six air masses as identified during SEAC[4]RS. Black symbols show the measured, initial size distributions; colored symbols are model results, color-coded by log ([absolute mass increase / $\mu g\ m^{-3}$].

Figure S2: Predicted relative mass concentration increase due to cloud processing in six air masses as identified during SEAC[4]RS. Black symbols show the measured, initial size distributions; colored symbols are model results, color-coded by O/C ratio.

Table S1: Initial gas phase mixing ratios [ppb]

	Marine	Urban	Biomass Burning	Agric biomass burning	Back-ground	Biogenic
SO_2	0.43	0.56	0.252	1.44	0.64	0.582
NO	0.028	0.2	0.137	0.352	0.112	0.062
NO_2	0.066	1.196	0.311	2.37	0.521	0.283
HCHO	0.883	2.64	4.04	14.4	2.8	4.2
H_2O_2	1.172	2.58	3.72	4.3	2.6	2.8
O_3	27	57	68	63	57	50
Isoprene	0.003	0.14	0.18	1.13	0.147	1.61
Monoterpenes	0.007	0.03	0.098	0.328	0.039	0.123
Methylvinyl ketone [1]	0.008	0.124	0.113	0.33	0.18	1.1
Methacrolein [1]	0.008	0.124	0.113	0.33	0.18	1.1
Toluene	0.009	0.07	0.125	0.243	0.041	0.056
Xylene [2]	0.005	0.035	0.067	0.12	0.02	0.028
Ethylene	0.0486	0.215	0.842	2.68	0.212	0.191

[1] The total of methyl vinyl ketone and methacrolein was measured by PTRMS. For model purposes, the total was equally split between the two compounds.

[2] Xylene measurements were not available. The mixing ratio was assumed to be 50% toluene.
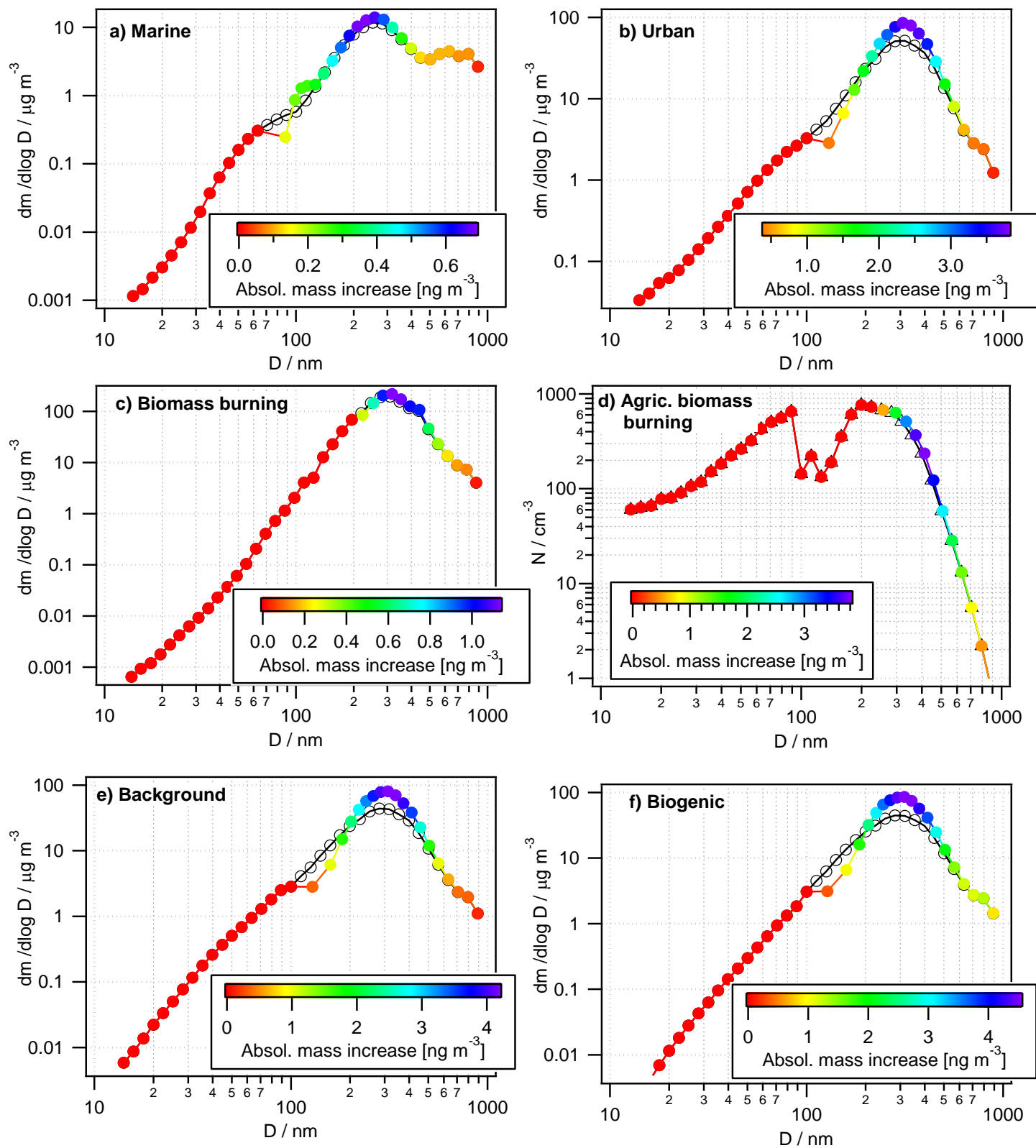
Figure S 1: Predicted relative mass concentration increase due to cloud processing in six air masses as identified during SEAC⁴RS. Black symbols show the measured, initial size distributions; colored symbols are model results, color-coded by the absolute increased in mass
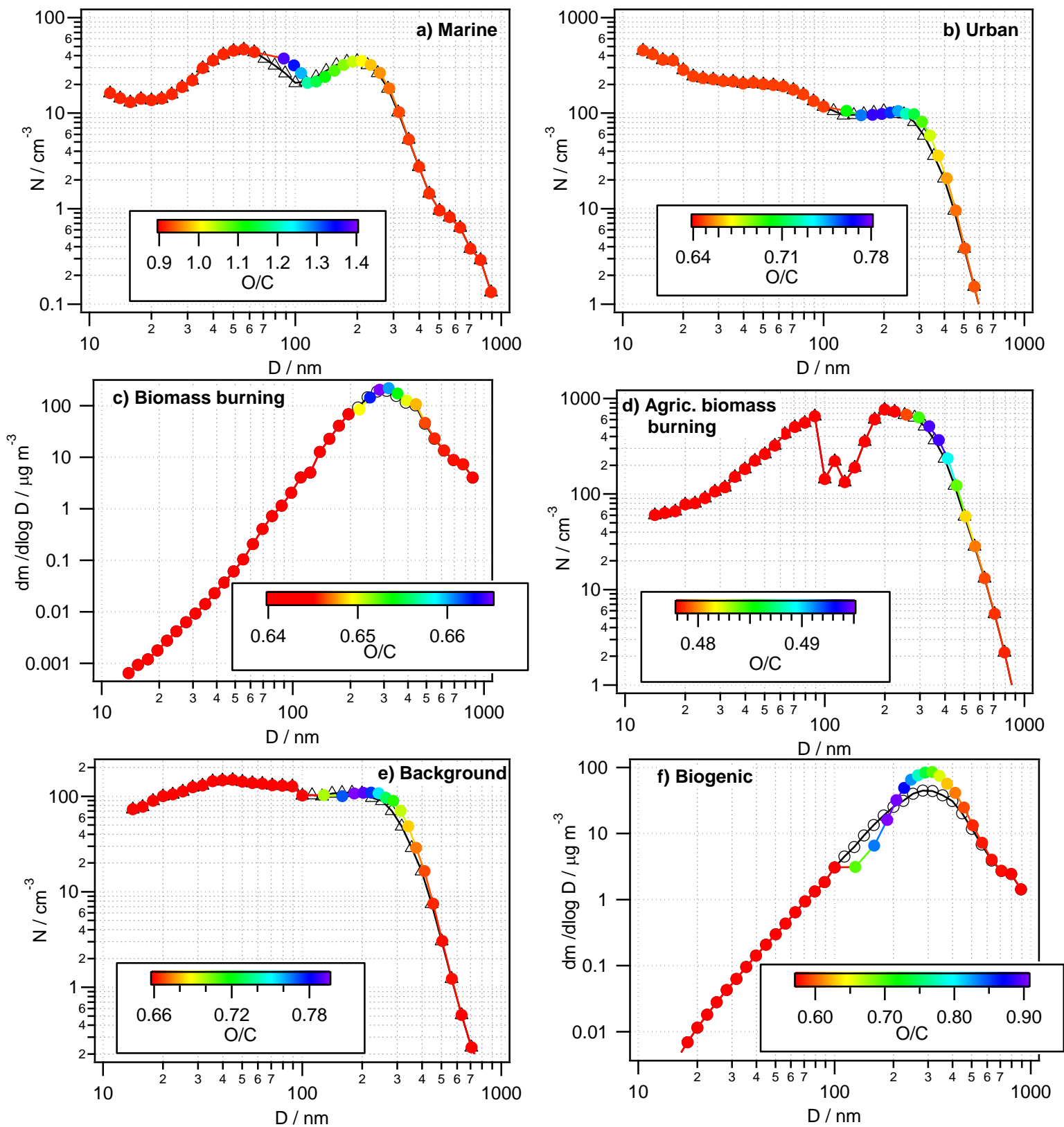
Figure S 2: Predicted relative mass concentration increase due to cloud processing in six air masses as identified during SEAC[4]RS. Black symbols show the measured, initial size distributions; colored symbols are model results, color-coded by O/C ratio.