Atmospheric
Chemistry
and Physics

Supplement of

Highly time-resolved chemical speciation and source apportionment of organic aerosol components in Delhi, India, using extractive electrospray ionization mass spectrometry

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Supplemental information
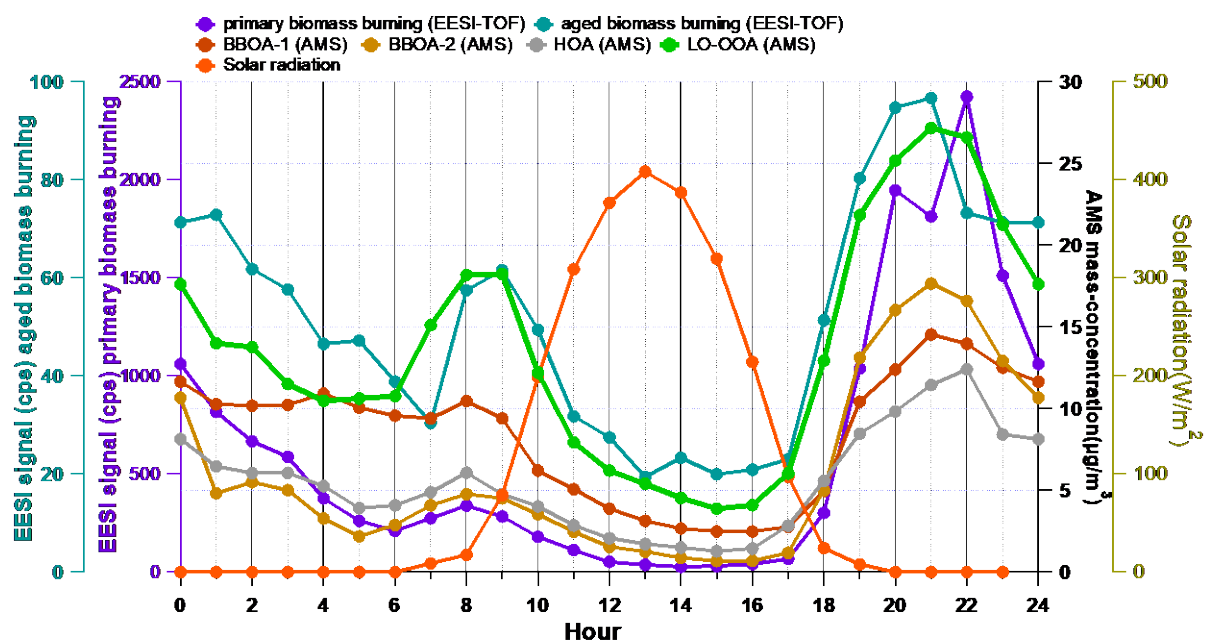
Figure S1: Diurnal trends of primary biomass burning and aged biomass burning from EESI-TOF along with BBOA, HOA and LO-OOA factors from AMS. The intensity of solar-radiation is also shown. Please note that the color used to represent primary biomass burning from EESI-TOF is different in this figure than the rest of figures to aid better visualisation.
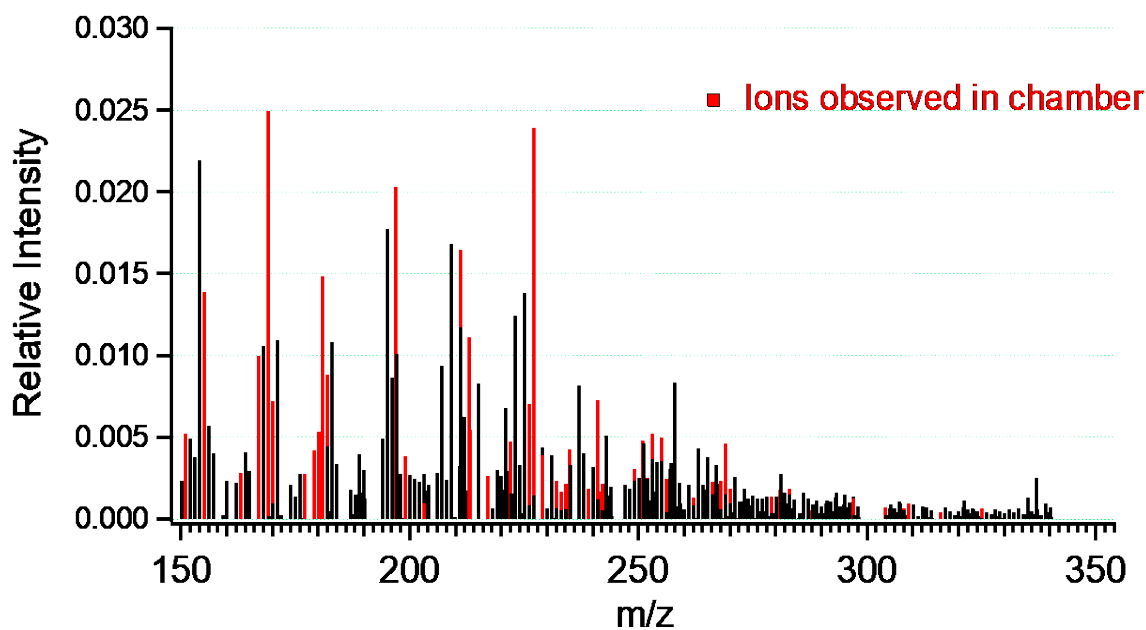

Figure S2: (a) Mass spectrum of aromatic SOA color-coded with ions also identified in chamber experiments exploring oxidation of an aromatic mixture by OH radicals.

| aromatic SOA | biogenic SOA | aged biomass burning | mixed urban SOA |
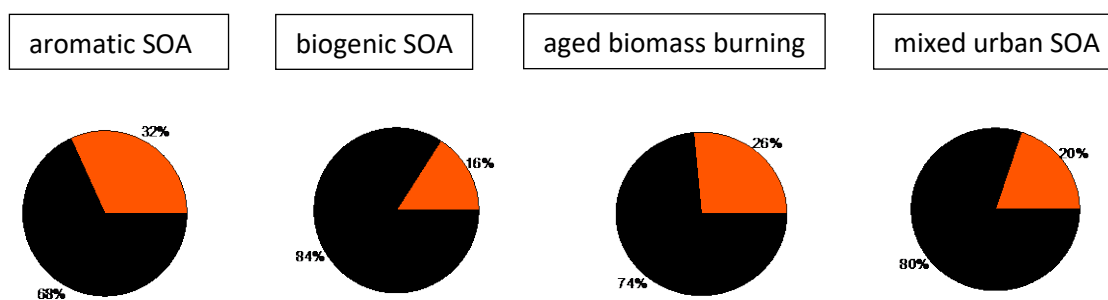
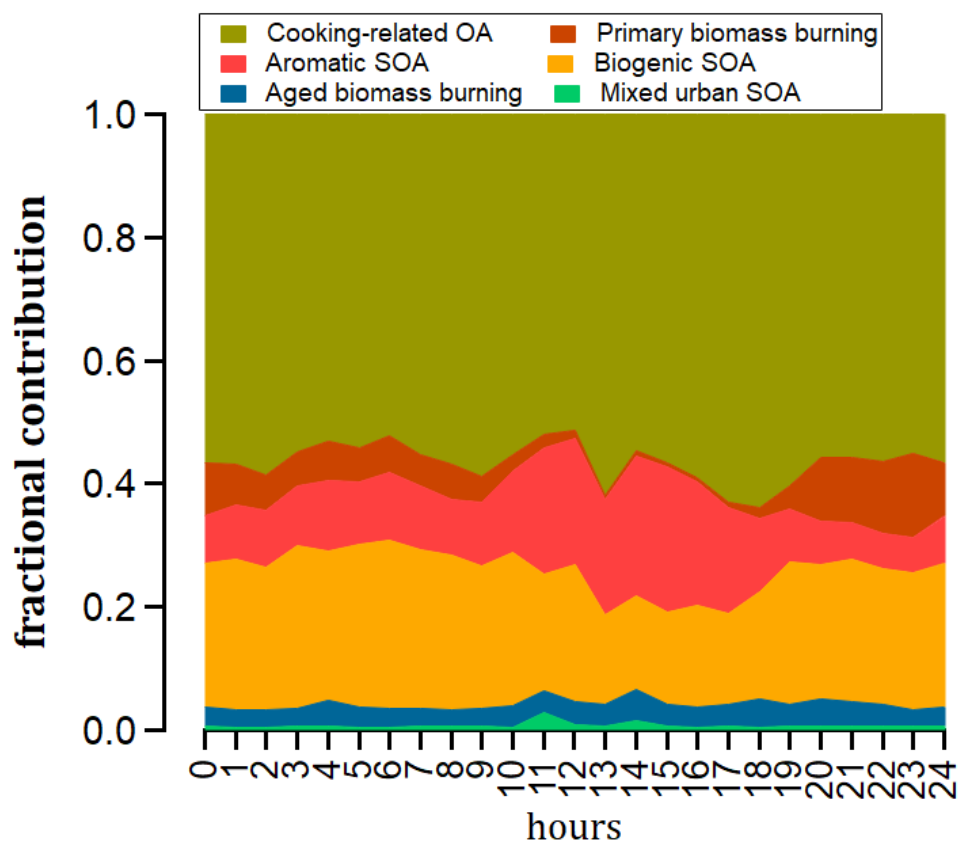

Figure S2: (b) Pie charts showing the percentage of total signal of SOA factors that is contributed by ions identified in chamber experiments.
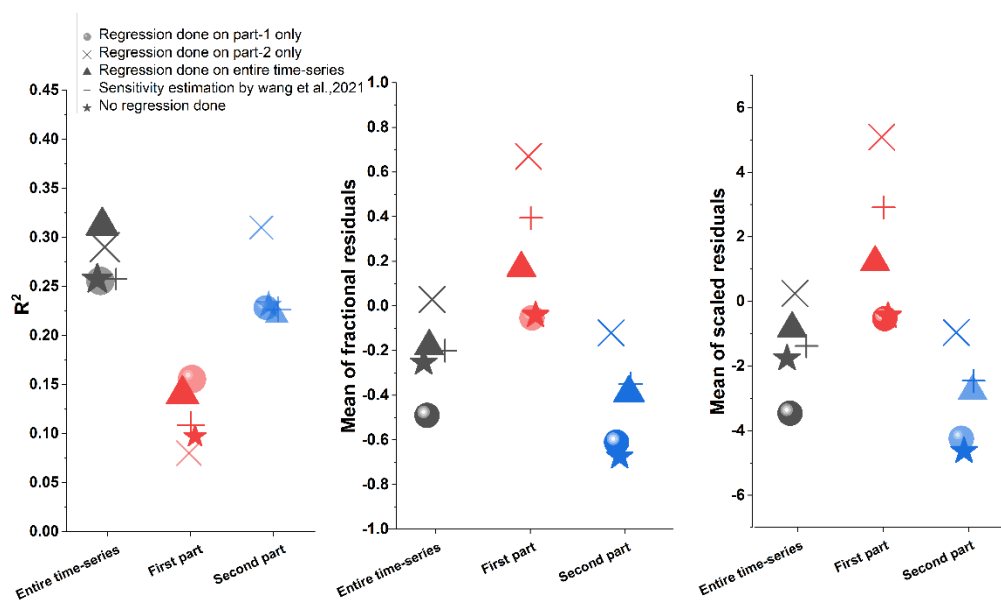
## (a) $C_{18}H_{34}O_2$ (oleic acid)
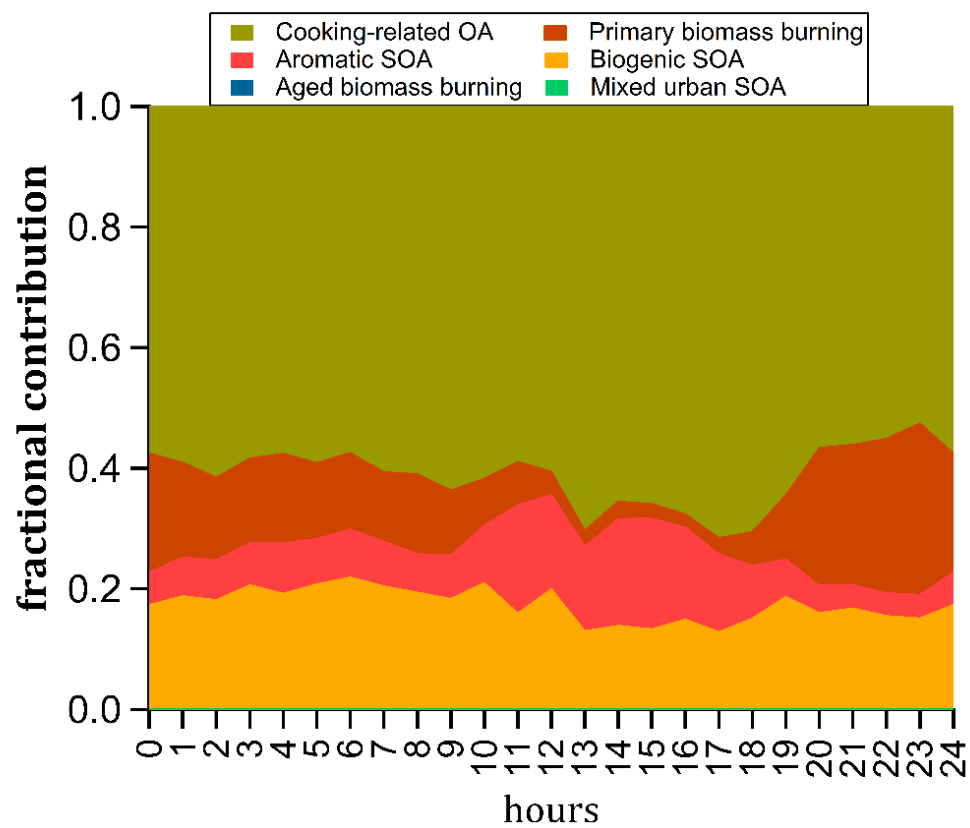
(b) C$_{16}$H$_{32}$O$_{2}$ (palmitic acid)

Figure S3: Fractional contribution of EESI-TOF factors to the diurnal trend of **(a)** C$_{18}$H$_{34}$O$_{2}$ (oleic acid) and **(b)** C$_{16}$H$_{32}$O$_{2}$ (palmitic acid) .These two compounds have been identified in previous cooking-related OA factors from EESI-TOF studies (Qi et al., 2019; Tong et al., 2021).

Figure S4: Evaluation of different treatments of EESI-TOF SOA factor sensitivities. Shown are Pearson R^2 (left panel),mean of fractional residuals (middle panel), and mean of uncertainty weighted residuals (right panel). Each panel is subdivided into trials on the entire time series, part-1 and part-2. The symbols denote the different strategies applied to calculate coefficients/sensitivities of EESI-TOF SOA factors were estimated.
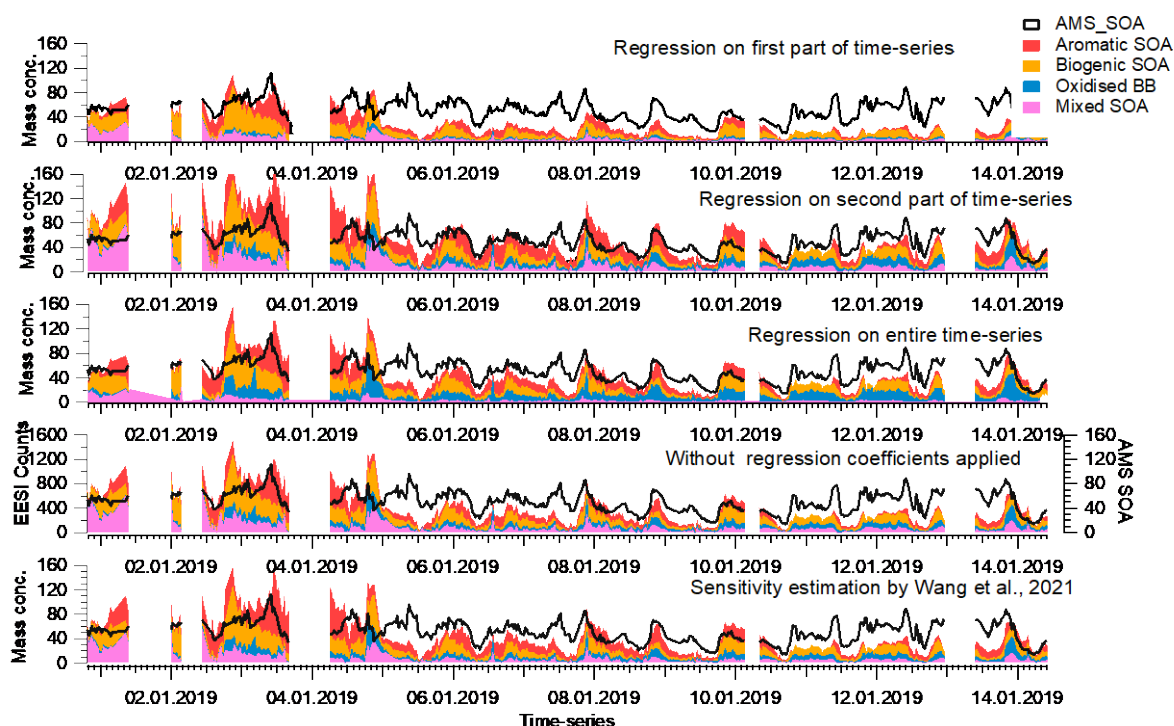
Figure S5: Stacked time series of individual SOA factors modelled using response factors obtained by MLR. Different panels show different strategies applied to calculate these response factors. Starting from top: MLR on only first part of time series, MLR on MLR on entire time series, part-1 of time series, part-2 of time series, no response factors applied i.e., applying bulk EESI-TOF sensitivies and response factors obtained using model of (Wang et al., 2021)

Factor	*a*-valuerange
Cooking-related OA	0-0.5
Aromatic SOA	0-0.2
Biogenic SOA	0-0.5
Agedbiomassburning	0-0.9
Mixed urban SOA	0-0.9

Table S1: The *a*-value limits used for different factors for the combined bootstrap/*a*-value randomization analysis

Bulk properties	Aromatic SOA	Biogenic SOA	Aged biomass burning	Mixed urban SOA	Primary biomass burning	Cooking-related OA
Average M.W	214.363	245	229	215	193	233.9
Bulk oxygen Num	4.7733	5.05	5.68	4.64	5.02	4.015
Bulk carbon Num	7.96483	9.69	8.34	8.25	6.49	9.482
Bulk hydrogen Num	11.9221	15.3	12.1	13	10.7	15.47
Bulk nitrogen Num	0.32652	0.27	0.13	0.2	0.03	0.298

Table S2: Bulk properties of EESI-TOF factors. These bulk properties represent average mean weight (M.W.) and mean oxygen number, carbon number, hydrogen number and nitrogen number of EESI-TOF factors.