



*Supplement of*

## **Reduced volatility of aerosols from surface emissions to the top of the planetary boundary layer**

**Quan Liu et al.**

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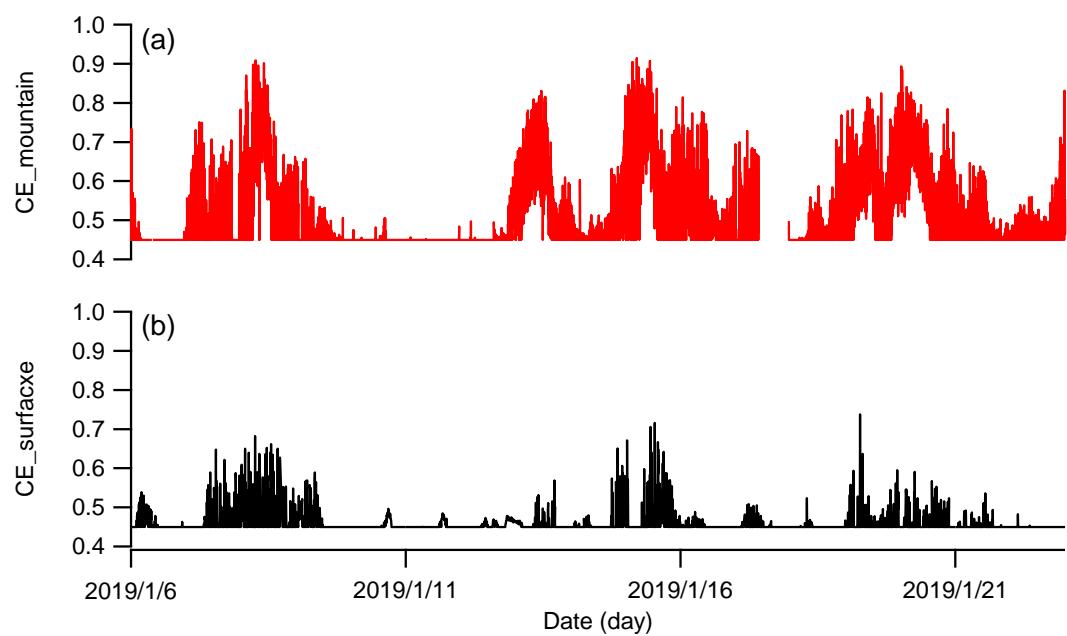
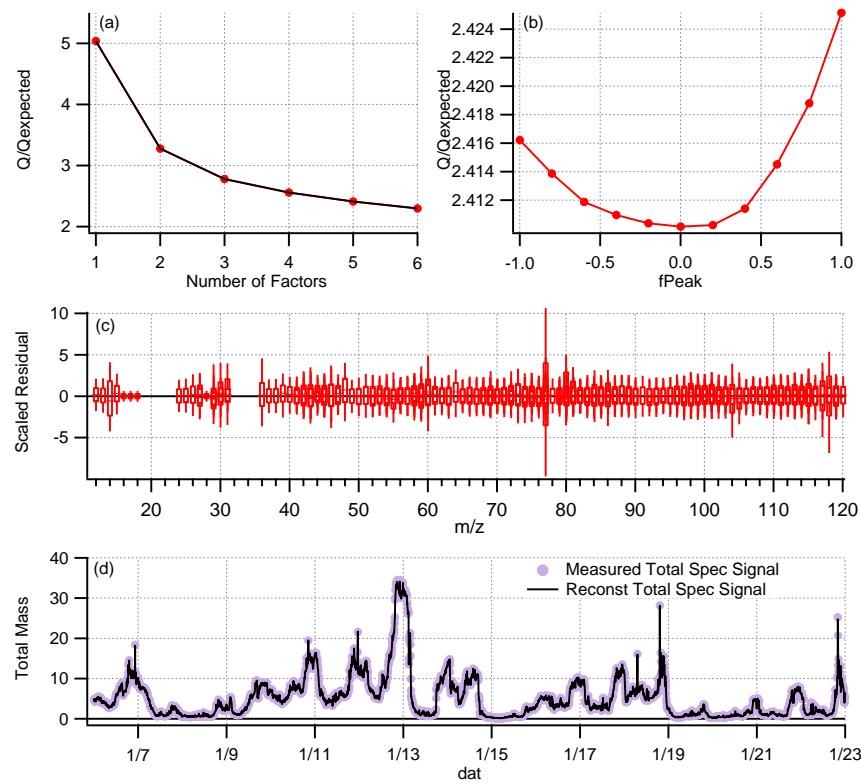
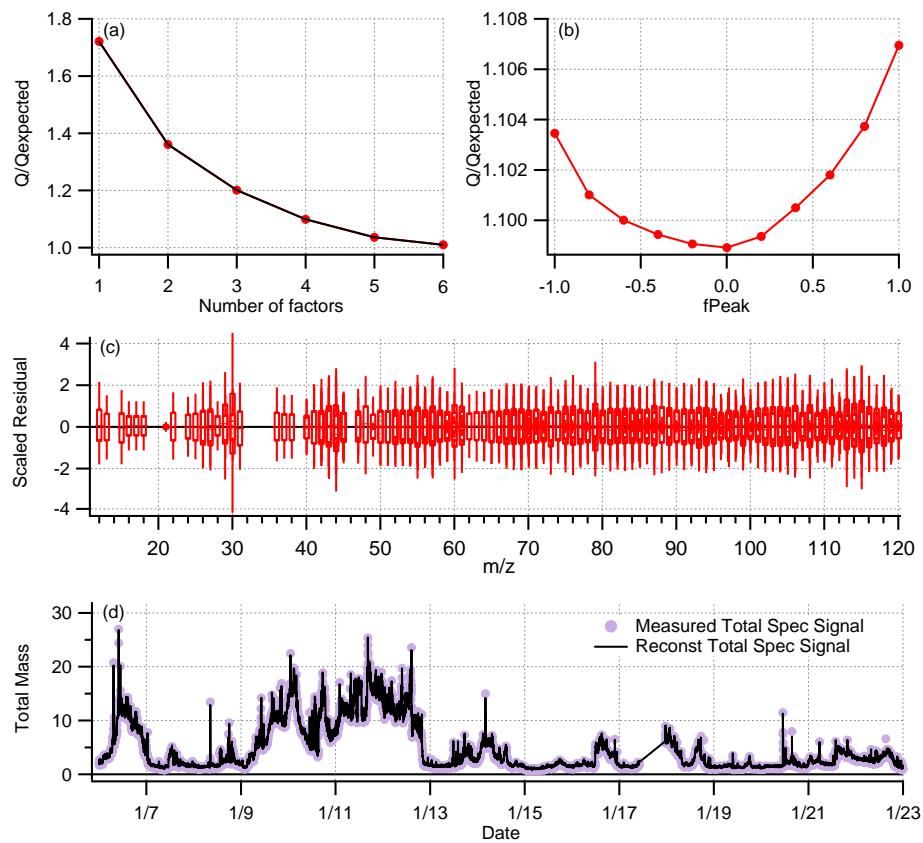


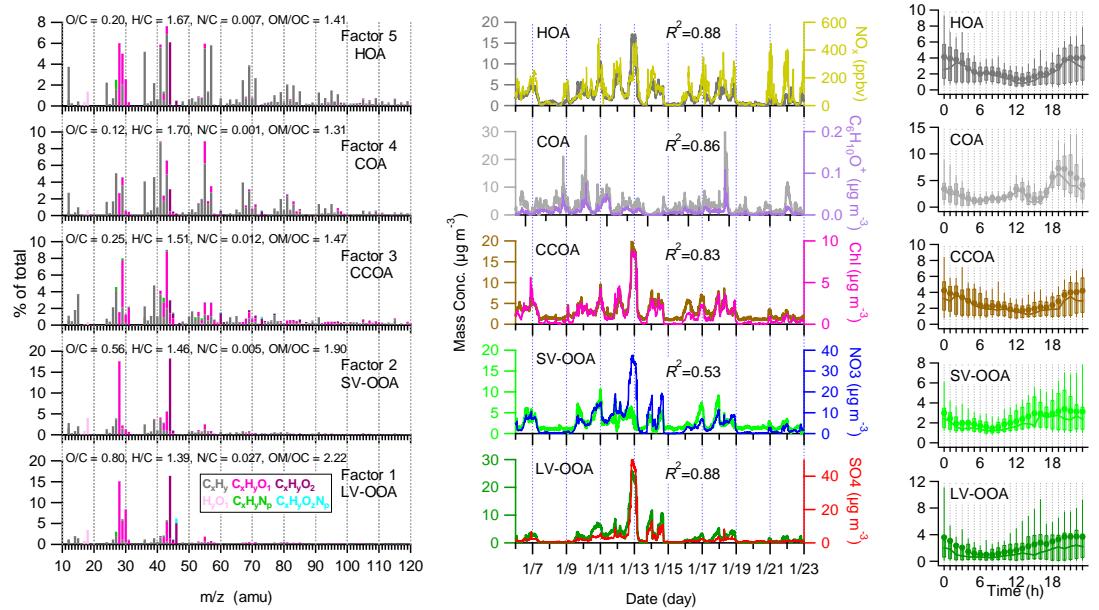
Fig. S1 Time series of the corrected collection efficiency (CE) at surface (black line) and mountain (red line) site respectively.



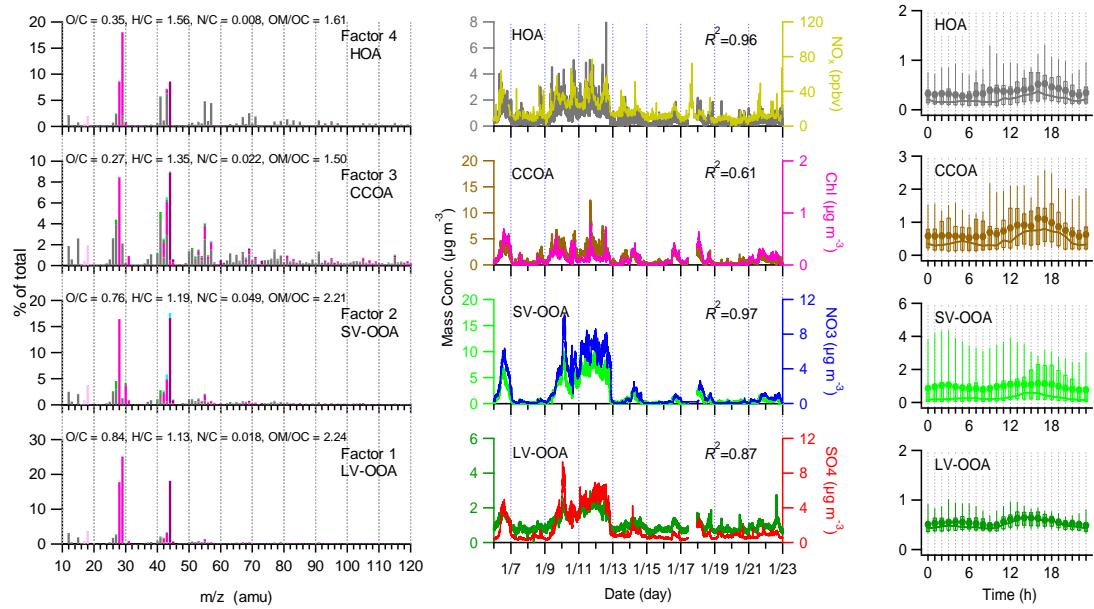
**Fig. S2** PMF diagnostic plots of the surface site: (a)  $Q/Q_{\text{expected}}$  varied as a function of the number of factors, (b)  $Q/Q_{\text{expected}}$  varied as a function of  $f_{\text{peak}}$ , (c) scaled residual for each  $m/z$ , (d) time series of measured and PMF reconstructed organic mass concentrations.



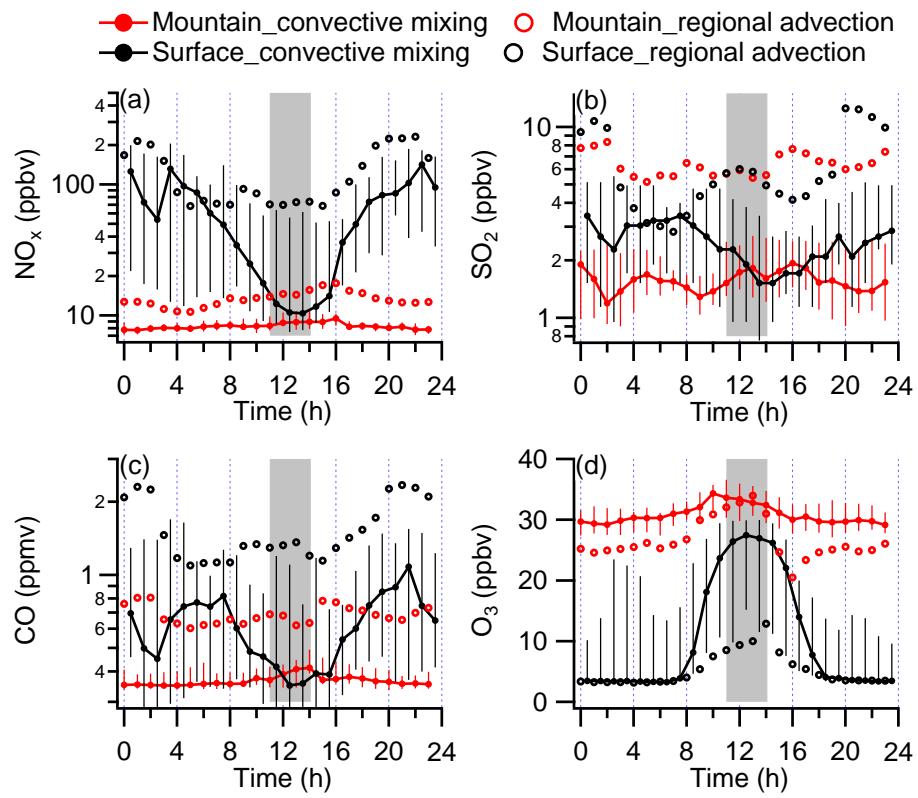
**Fig. S3** PMF diagnostic plots of the mountain site: (a)  $Q/Q_{\text{expected}}$  varied as a function of the number of factors, (b)  $Q/Q_{\text{expected}}$  varied as a function of  $f_{\text{peak}}$ , (c) scaled residual for each  $m/z$ , (d) time series of measured and PMF reconstructed organic mass concentrations.



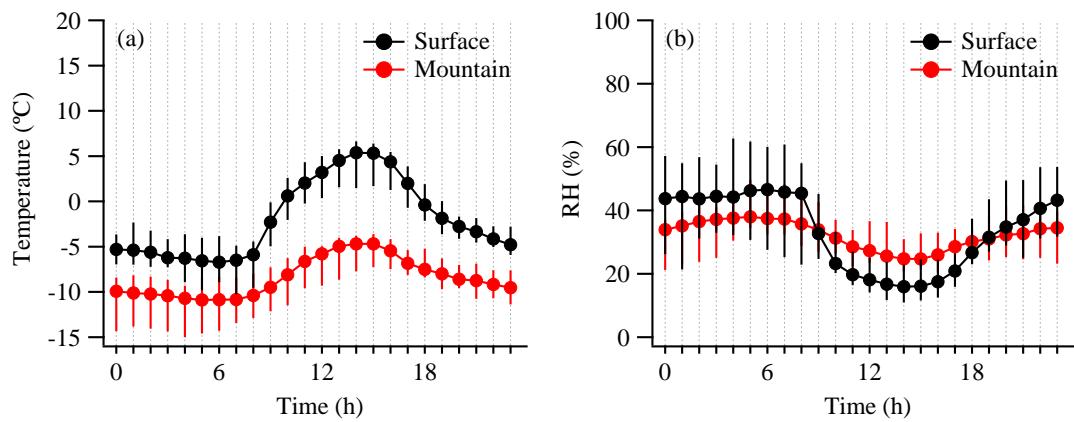
**Fig. S4** Mass spectra (left column), time series (middle column), and diurnal variations (right column) of organic factors derived from the data of the surface site. Time series of corresponding tracers are given in the middle column for comparisons.



**Fig. S5** Mass spectra (left column), time series (middle column), and diurnal variations (right column) of organic factors derived from the data of the mountain site. Time series of corresponding tracers are given in the middle column for comparisons.



**Fig. S6** Diurnal variations of (a)  $\text{NO}_x$ , (b)  $\text{SO}_2$ , (c)  $\text{CO}$ , and (d)  $\text{O}_3$  during the observation. Black and red colors represent the surface and mountain sites respectively. Solid circles and error bars show the median, 75<sup>th</sup>, and 25<sup>th</sup> percentiles in CM period. Circle markers show the mean value in RA period.



**Fig. S7** Diurnal variations of (a) Temperature, and (b) relative humidity (RH) during the observation. Black and red colors represent the surface and mountain sites respectively. Solid circles show the mean value with error bars of 75<sup>th</sup>, and 25<sup>th</sup> percentiles.