



*Supplement of*

## **Impacts of biomass burning and photochemical processing on the light absorption of brown carbon in the southeastern Tibetan Plateau**

**Jie Tian et al.**

*Correspondence to:* Qiyuan Wang (wangqy@ieecas.cn) and Junji Cao (jjcao@mail.iap.ac.cn)

The copyright of individual parts of the supplement might differ from the article licence.

12 **Text S1 Statistical metrics**

13 The uncentered correlation coefficient (UC) is a qualitative metric to characterize the similarity between mass spectra of  
14 sources, which is defined as follows (Ulbrich et al., 2009):

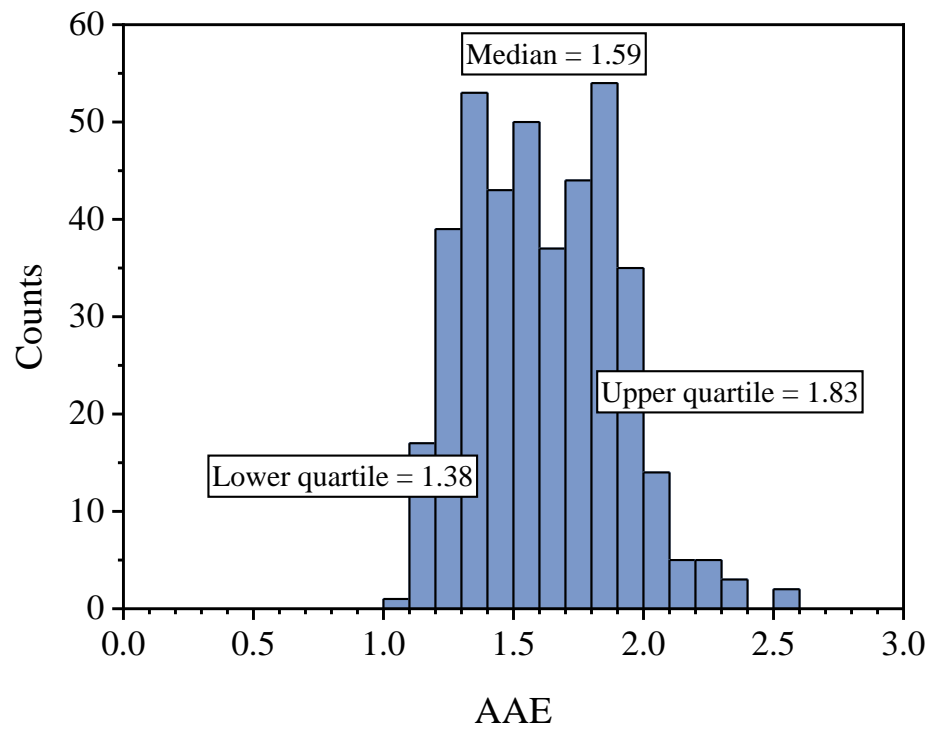
15 
$$UC = \frac{x \cdot y}{\|x\| \|y\|} \quad (1)$$

16 Here,  $x$  and  $y$  represent a pair of mass spectra as vectors.

17 The index of agreement (IOA) is used as an indicator to evaluate the performance of the simulated data from MLR model  
18 against the measured data (Willmott, 1981). The IOA varies between 0 (no agreement) and 1 (perfect agreement), and  
19 can be expressed as:

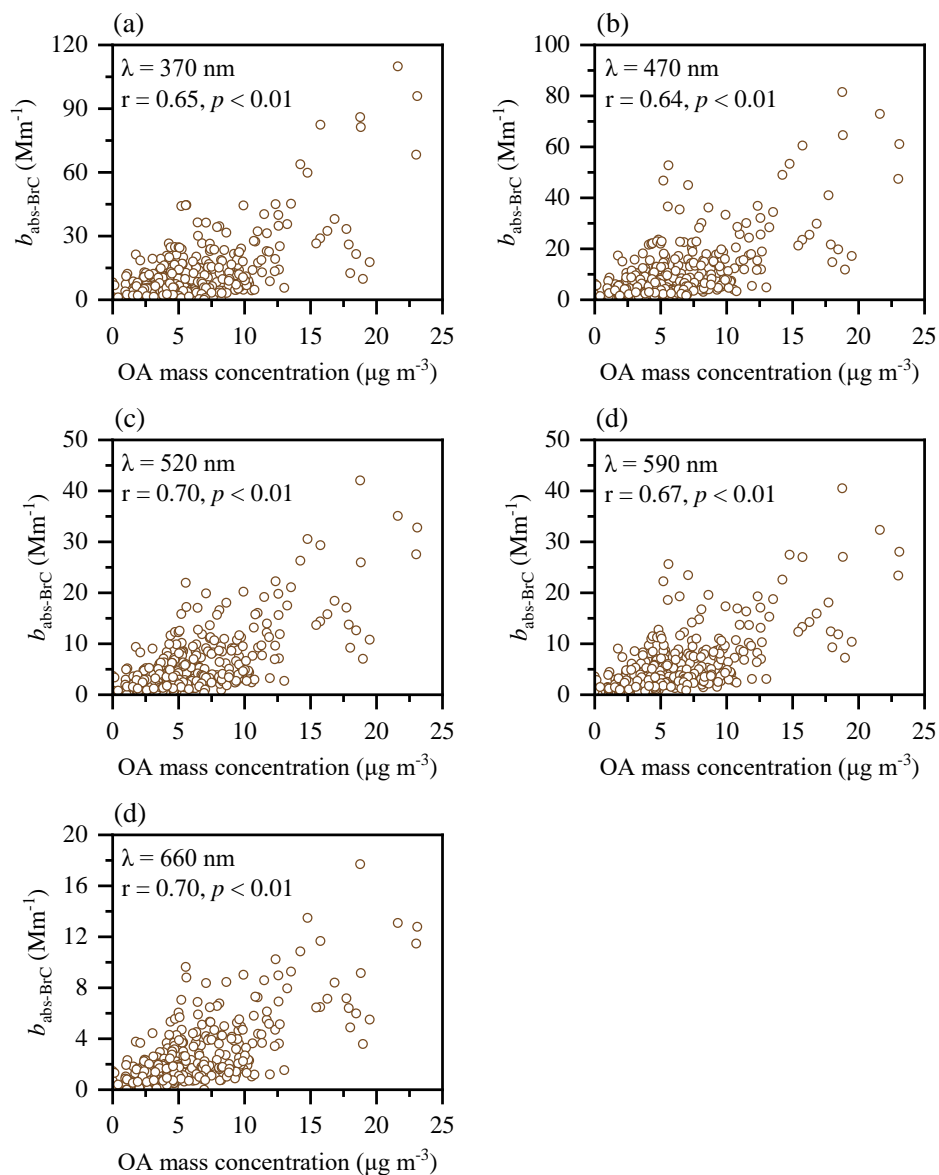
20 
$$IOA = 1 - \frac{\sum_{i=1}^N (S_i - M_i)^2}{\sum_{i=1}^N (|S_i - M_{ave}| + |M_i - M_{ave}|)^2} \quad (2)$$

21 Here,  $N$  is the total number of the simulated data;  $S_i$  and  $M_i$  are the simulated and measured  $b_{\text{abs-BrC}}$ , respectively; and  
22  $M_{ave}$  is the average measured  $b_{\text{abs-BrC}}$ .



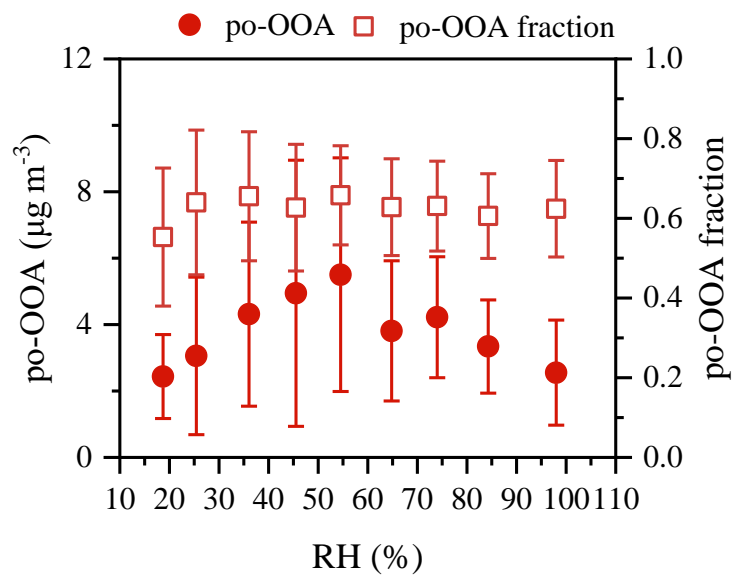
23

24 **Figure S1.** Frequency histograms of hourly absorption Ångström exponent (AAE) values during the entire campaign.



25

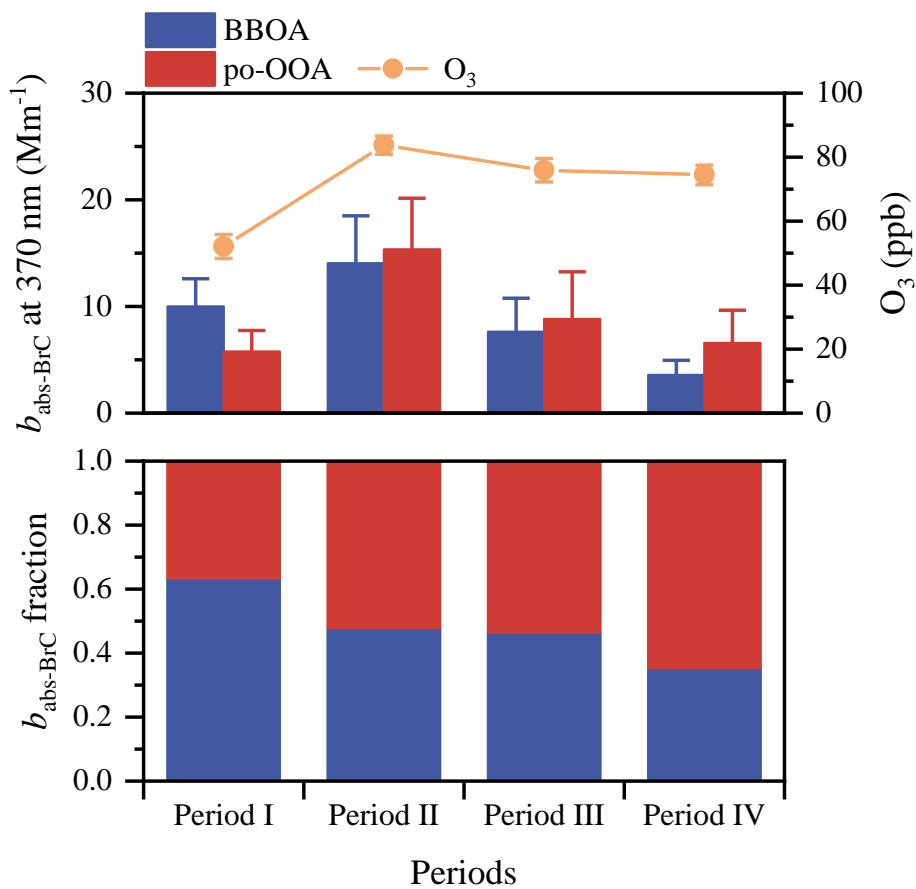
26 **Figure S2.** Pearson correlations between OA mass concentration and light absorption coefficient of BrC ( $b_{\text{abs-BrC}}$ ) at the  
 27 wavelength ( $\lambda$ ) of (a) 370 nm, (b) 470 nm, (c) 520 nm, (d) 590 nm, and (e) 660 nm.



28

29 **Figure S3.** Variations of po-OOA mass concentration and its fraction in OA as a function of RH. The data are grouped in RH

30 bins (10 % increment).



31  
 32 **Figure S4.** Light absorption coefficient of BrC ( $b_{\text{abs-BrC}}$ ) at 370 nm from BBOA and po-OOA and its fraction in the total  
 33 reconstructed BrC absorption at different periods.  
 34

35 **References**

- 36 Ulbrich, I. M., Canagaratna, M. R., Zhang, Q., Worsnop, D. R., and Jimenez, J. L.: Interpretation of organic components  
37 from Positive Matrix Factorization of aerosol mass spectrometric data, *Atmos. Chem. Phys.*, 9, 2891–2918,  
38 <https://doi.org/10.5194/acp-9-2891-2009>, 2009.
- 39 Willmott, C. J.: On the validation of models. *Phys. Geogr.*, 2, 184–194,  
40 <https://doi.org/10.1080/02723646.1981.10642213>, 1981.