

Supplementary Information

**Reconstructed light extinction coefficients of fine particulate matter  
in rural Guangzhou, southern China**

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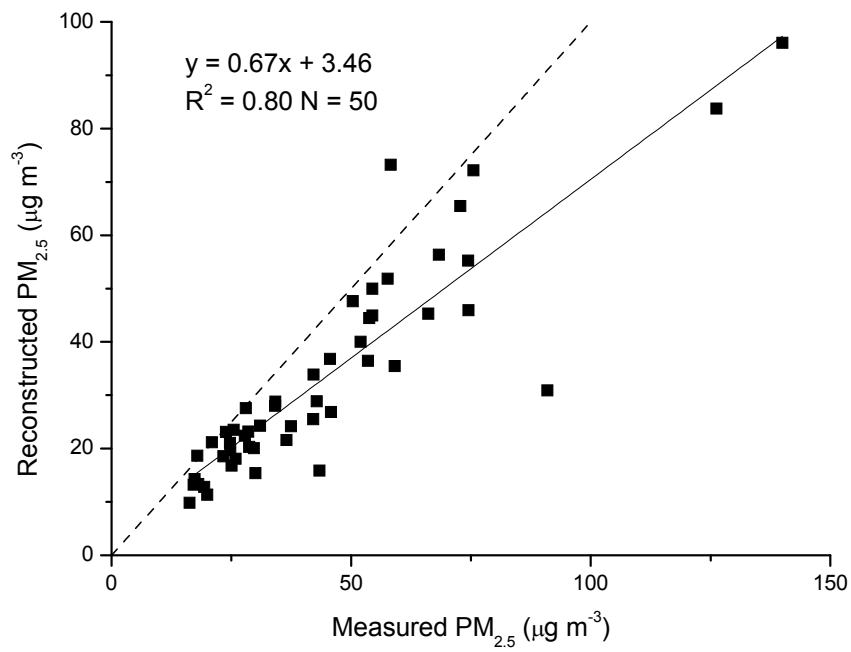
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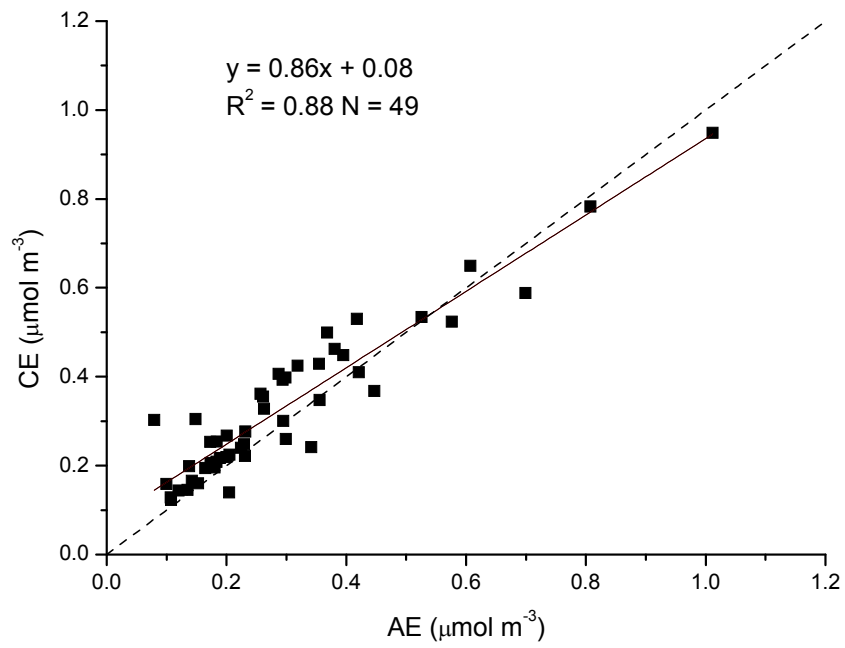
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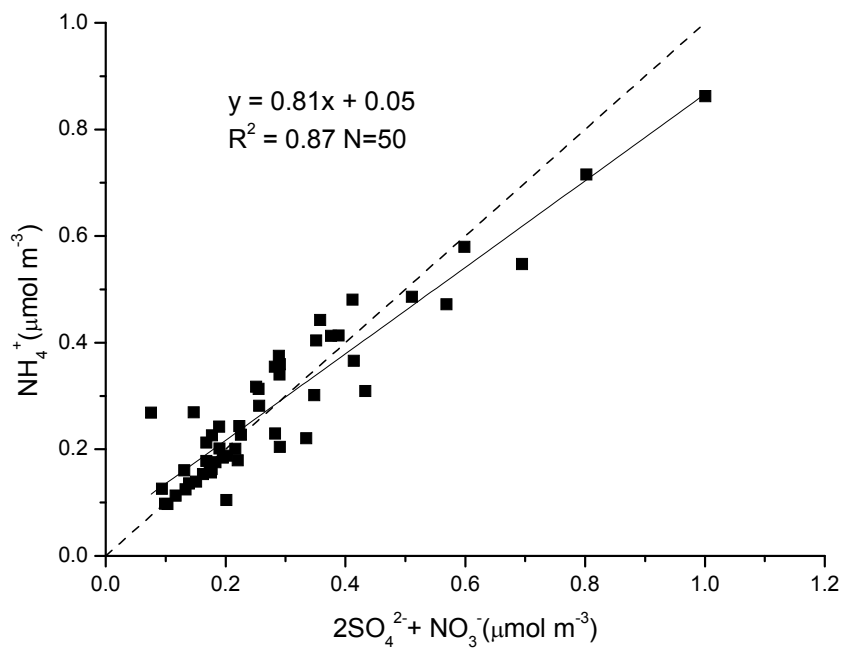
E-mail: sclai@scut.edu.cn(S.C. Lai); zhyy@scut.edu.cn (Y.Y. Zhang)



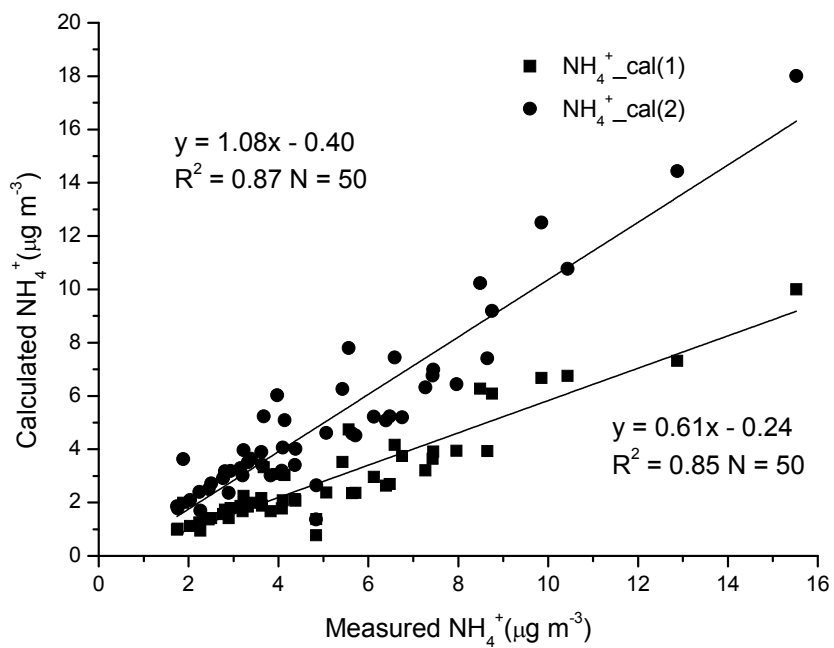
**Fig. S1.** Scatter plot of reconstructed  $\text{PM}_{2.5}$  versus measured  $\text{PM}_{2.5}$  for  $\text{PM}_{2.5}$  samples collected in TH from March 2012 to February 2013.



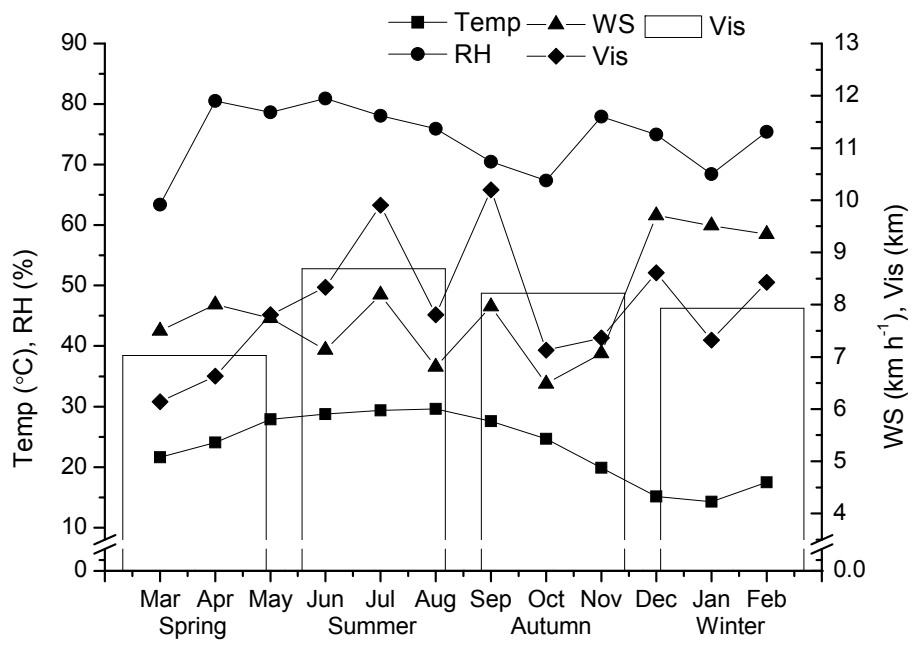
**Fig. S2.** Scatter plot of anion equivalence versus cation equivalence. Cation equivalent (CE) =  $c(\text{NH}_4^+)/18.0 + c(\text{Na}^+)/23.0 + c(\text{K}^+)/39.1$ , anion equivalent (AE) =  $c(\text{SO}_4^{2-})/48.0 + c(\text{NO}_3^-)/62.0 + c(\text{Cl}^-)/35.5$ .



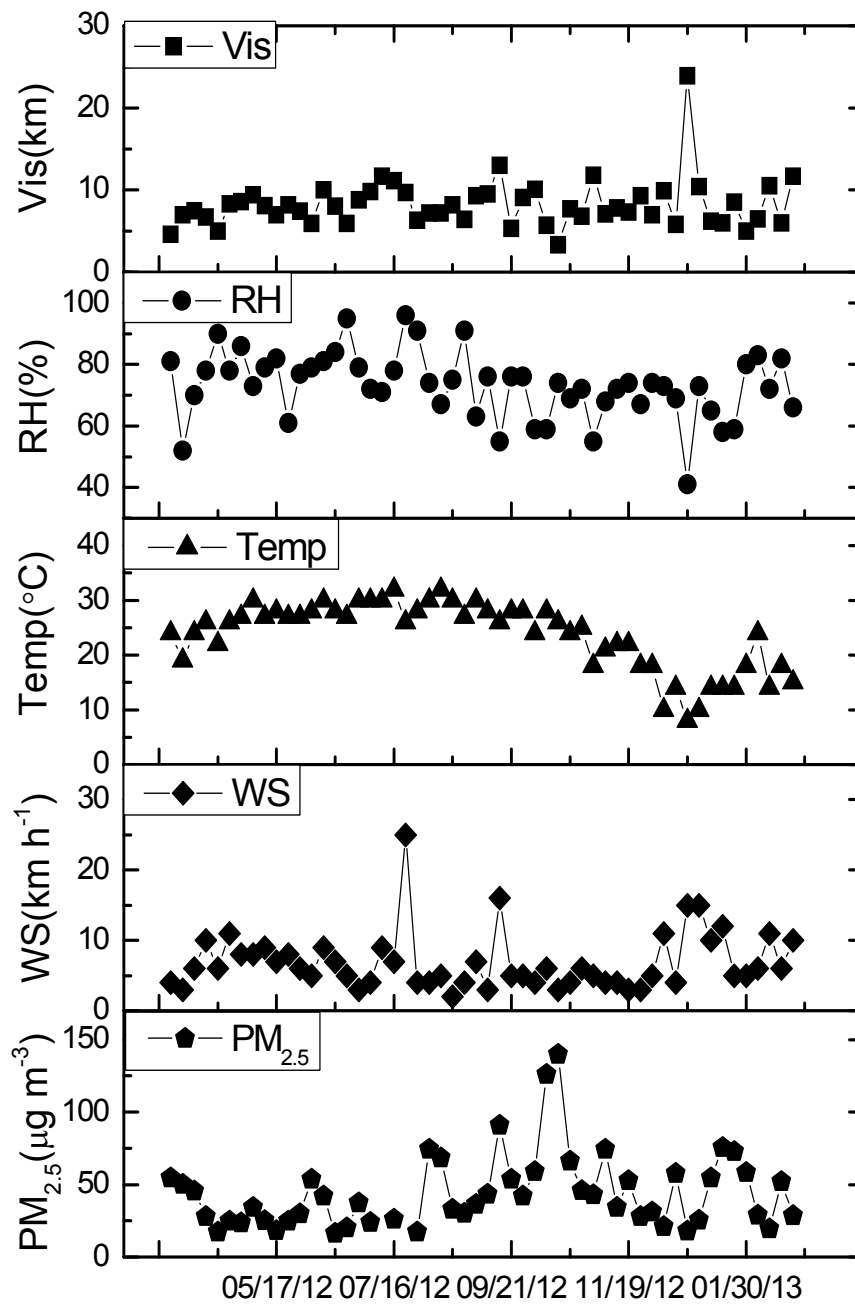
**Fig. S3.** Scatter plot of  $\text{NH}_4^+$  ( $\mu\text{mol m}^{-3}$ ) versus  $2\text{SO}_4^{2-} + \text{NO}_3^-$  ( $\mu\text{mol m}^{-3}$ ) for  $\text{PM}_{2.5}$  samples collected in TH from March 2012 to February 2013.



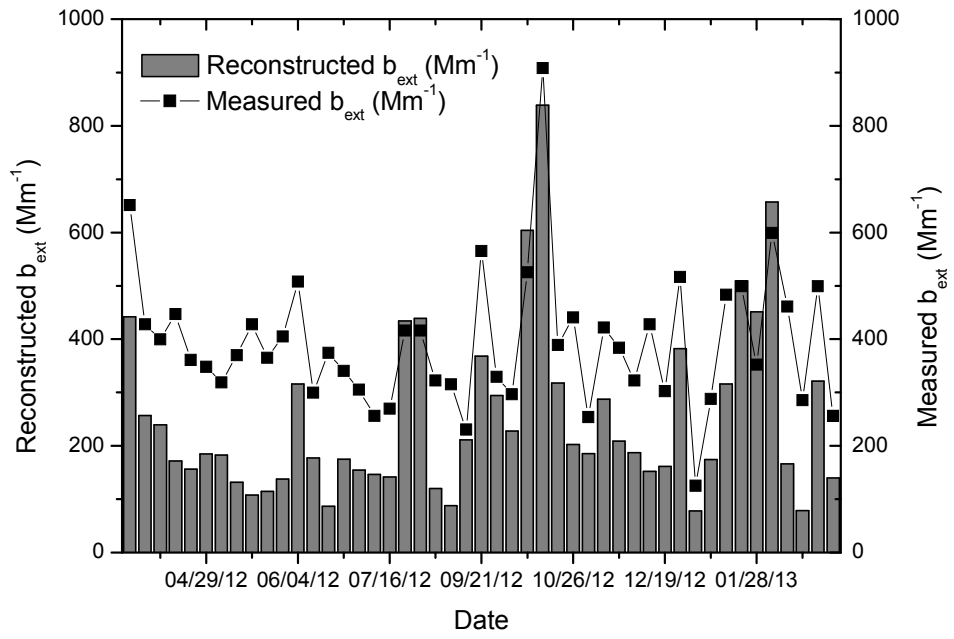
**Fig. S4.** Scatter plot of ammonium calculated from (1)  $[(\text{NH}_4)\text{HSO}_4] = 0.29 \times [\text{NO}_3^-] + 0.19 \times [\text{SO}_4^{2-}]$  and (2)  $[(\text{NH}_4)_2\text{SO}_4] = 0.29 \times [\text{NO}_3^-] + 0.375 \times [\text{SO}_4^{2-}]$  versus ammonium measured by ion chromatography for  $\text{PM}_{2.5}$  samples collected in TH from March 2012 to February 2013.



**Fig. S5.** Temporal variations of visibility (Vis), relative humidity (RH), temperature (Temp), and wind speed (WS) from March 18, 2012 to February 23, 2013.

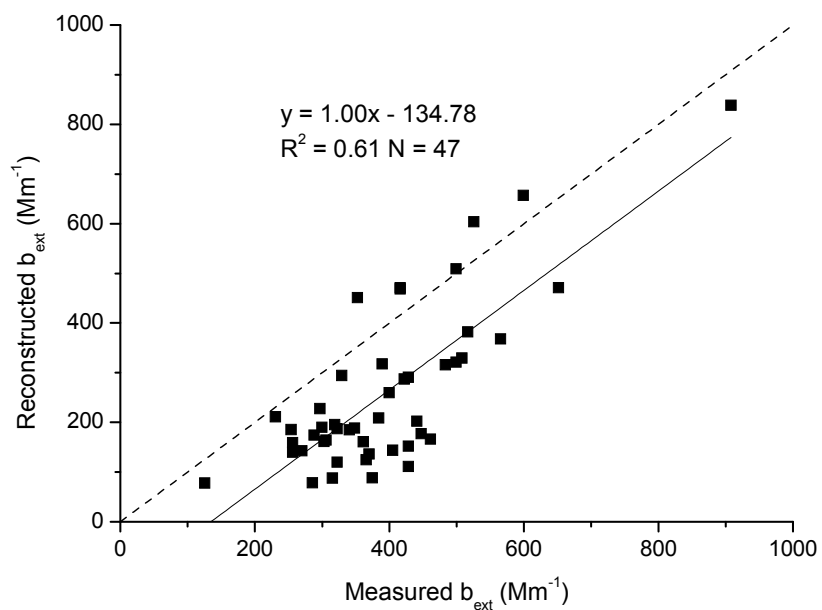


**Fig. S6.** Temporal variations of visibility (Vis), relative humidity (RH), temperature (Temp), and wind speed (WS) and PM<sub>2.5</sub> on sampling days from March 18, 2012 to February 23, 2013.



**Fig. S7.** Temporal variations of reconstructed  $b_{ext}$  and measured  $b_{ext}$ .





**Fig. S8.** Scatter plot of reconstructed  $b_{ext}$  based on the IMPROVE formula versus measured  $b_{ext}$  ( $OM = 2.0 \cdot OC$ ).

**Table S1.** Correlation coefficients of visibility with meteorological parameters and major chemical species in PM<sub>2.5</sub>.

|                     | RH      | Temp   | WS     | PM <sub>2.5</sub> | SO <sub>4</sub> <sup>2-</sup> | NH <sub>4</sub> <sup>+</sup> | NO <sub>3</sub> <sup>-</sup> | OC      | EC      | Na <sup>+</sup> | Cl <sup>-</sup> | K <sup>+</sup> |
|---------------------|---------|--------|--------|-------------------|-------------------------------|------------------------------|------------------------------|---------|---------|-----------------|-----------------|----------------|
| Annual              | -0.53** | -0.26  | 0.53** | -0.31*            | -0.37**                       | -0.36**                      | -0.29*                       | -0.36** | -0.36*  | -0.10           | -0.13           | -0.39**        |
| Annual <sup>a</sup> | -0.50** | -0.25  | 0.53** | -0.39*            | -0.44**                       | -0.47**                      | -0.34*                       | -0.47** | -0.43** | -0.17           | -0.18           | -0.45**        |
| Spring              | -0.28   | 0.60*  | 0.54   | -0.25             | -0.35                         | -0.31                        | -0.45                        | -0.20   | -0.14   | -0.12           | -0.20           | -0.24          |
| Spring <sup>a</sup> | -0.07   | 0.51   | 0.54   | -0.55             | -0.65*                        | -0.62                        | -0.66*                       | -0.47   | -0.33   | -0.28           | -0.42           | -0.38          |
| Summer              | -0.52   | 0.64*  | 0.57*  | -0.15             | -0.18                         | -0.15                        | -0.20                        | -0.08   | -0.12   | 0.58*           | 0.23            | 0.20           |
| Summer <sup>a</sup> | -0.10   | 0.40   | 0.55   | -0.60             | -0.64*                        | -0.59                        | -0.50                        | -0.46   | -0.31   | 0.50            | 0.15            | 0.31           |
| Autumn              | -0.58*  | -0.28  | 0.54   | -0.43             | -0.61*                        | -0.76**                      | -0.56                        | -0.75** | -0.74*  | -0.81**         | -0.54           | -0.76**        |
| Winter              | -0.72** | -0.61* | 0.60*  | -0.57*            | -0.48                         | -0.57*                       | -0.32                        | -0.51   | -0.50   | -0.01           | -0.20           | -0.42          |

\* Correlation is significant at the 0.05 level (2-tailed test).

\*\* Correlation is significant at the 0.01 level (2-tailed test).

<sup>a</sup> Correlation coefficients after excluding samples with RH  $\geq$  90%.

RH: relative humidity, Temp: temperature, WS: wind speed