

Supplement of

# AIRS and MODIS Satellite-based Assessment of Air Pollution in Southwestern China: Impact of Stratospheric Intrusions and Cross-Border Transport of Biomass Burning

Puyu Lian <sup>1</sup>, Kaihui Zhao <sup>2\*</sup>, Zibing Yuan <sup>1</sup>

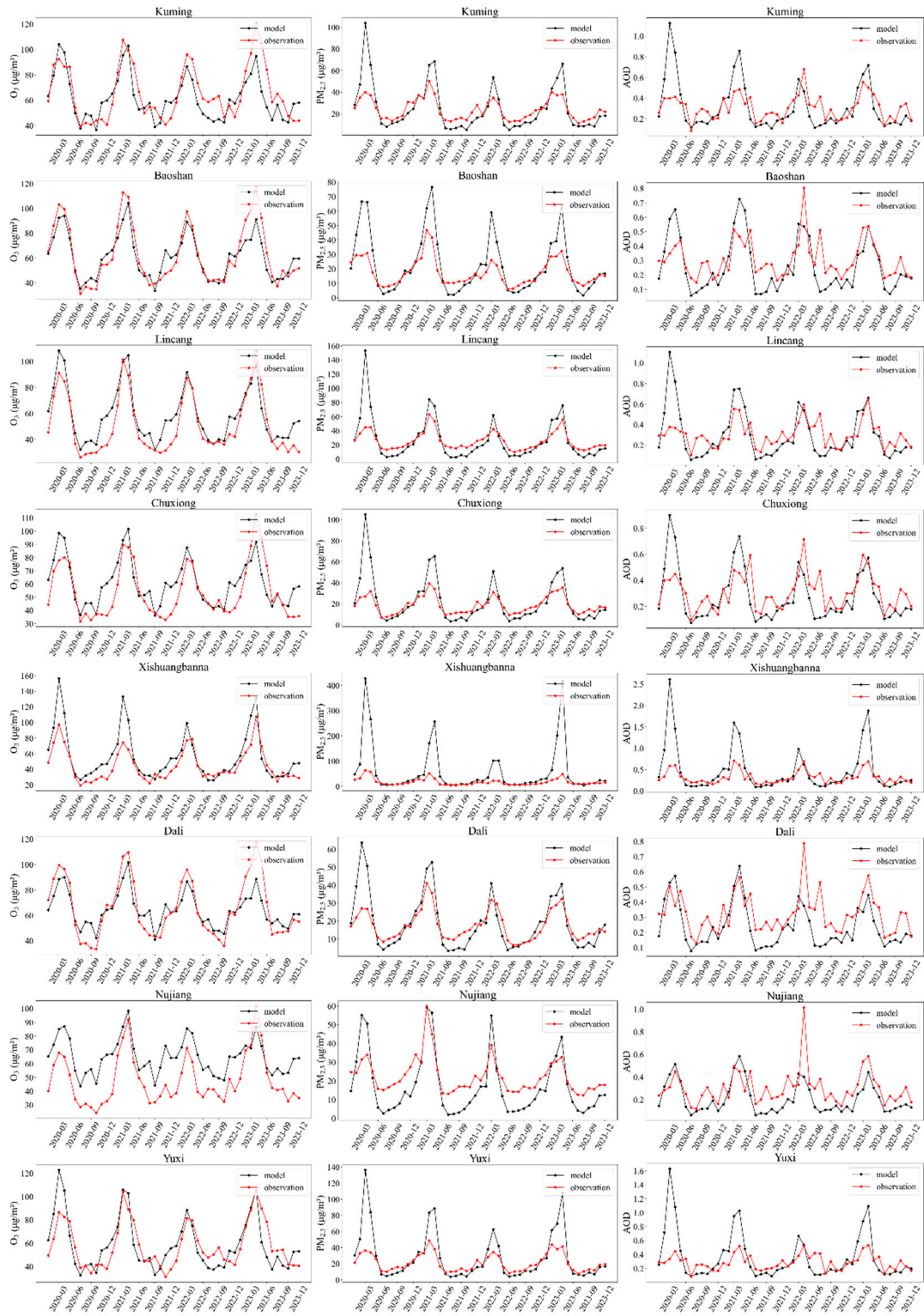
<sup>1</sup> School of Environment and Energy, South China University of Technology, Guangzhou 510006, China; espuyu@mail.scut.edu.cn (P.L.); [zibing@scut.edu.cn](mailto:zibing@scut.edu.cn) (Z.Y.)

<sup>2</sup> Yunnan Key Laboratory of Meteorological Disasters and Climate Resources in the Greater Mekong Subregion, Yunnan University, Kunming, 650091, China; khzhao@ynu.edu.cn (K.Z.)

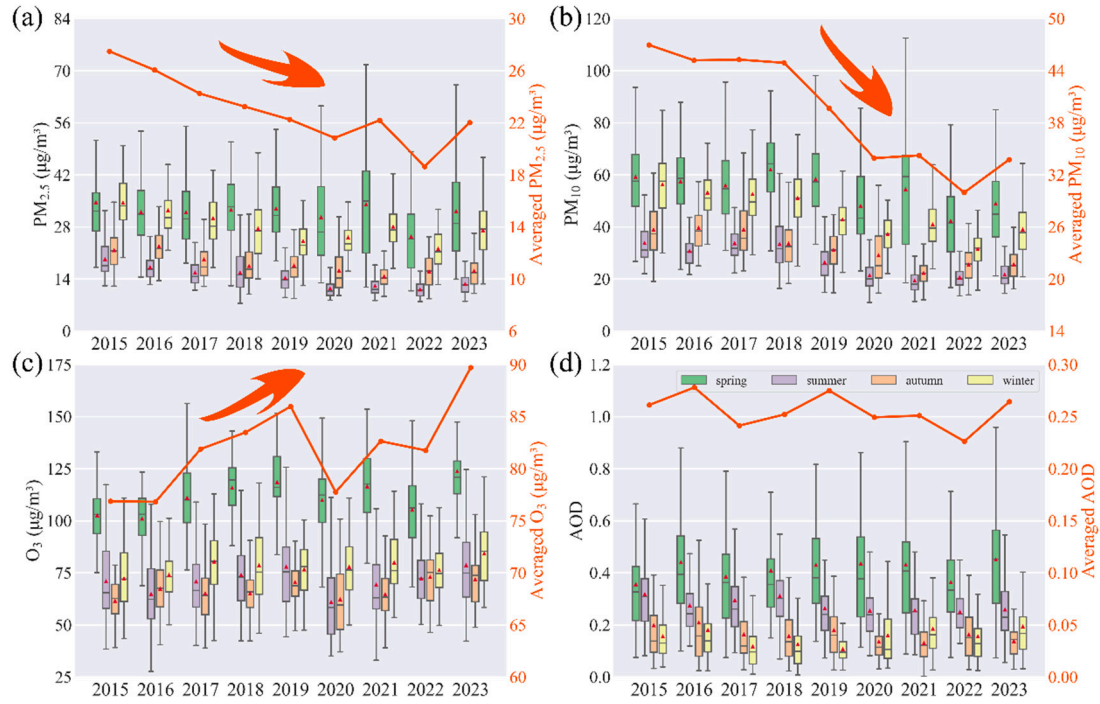
\* Correspondence: khzhao@ynu.edu.cn; Tel.: +86-177-9100-8508

**Table S1.** Statistical evaluation of monthly averaged O<sub>3</sub>, PM<sub>2.5</sub> and AOD concentration.

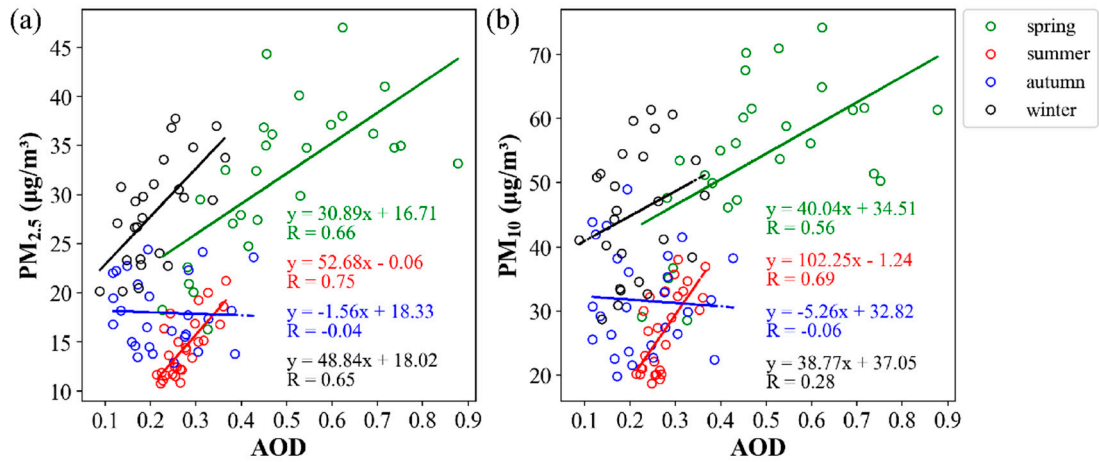
Pollutants	Cities	R	RMSE	MB
O <sub>3</sub>	Kunming	0.79	13.81	11.71
	Baoshan	0.93	9.92	7.90
	Lincang	0.92	11.64	9.34
	Chuxiong	0.78	14.06	11.30
	Xishuangbanna	0.90	18.91	13.71
	Dali	0.92	11.77	9.35
	Nujiang	0.82	19.81	18.02
	Yuxi	0.79	13.74	11.22
	<b>Mean</b>	<b>0.86</b>	<b>14.21</b>	<b>11.57</b>
PM <sub>2.5</sub>	Kunming	0.88	13.68	8.89
	Baoshan	0.91	13.10	8.51
	Lincang	0.87	19.24	11.45
	Chuxiong	0.84	15.05	8.54
	Xishuangbanna	0.89	83.08	34.06
	Dali	0.88	8.69	5.97
	Nujiang	0.90	10.12	8.95
	Yuxi	0.86	22.39	11.97
	<b>Mean</b>	<b>0.88</b>	<b>23.17</b>	<b>12.29</b>
AOD	Kunming	0.64	0.18	0.13
	Baoshan	0.71	0.14	0.11
	Lincang	0.64	0.18	0.13
	Chuxiong	0.64	0.16	0.11
	Xishuangbanna	0.82	0.44	0.24
	Dali	0.65	0.13	0.11
	Nujiang	0.63	0.15	0.12
	Yuxi	0.62	0.29	0.18
	<b>Mean</b>	<b>0.67</b>	<b>0.21</b>	<b>0.14</b>



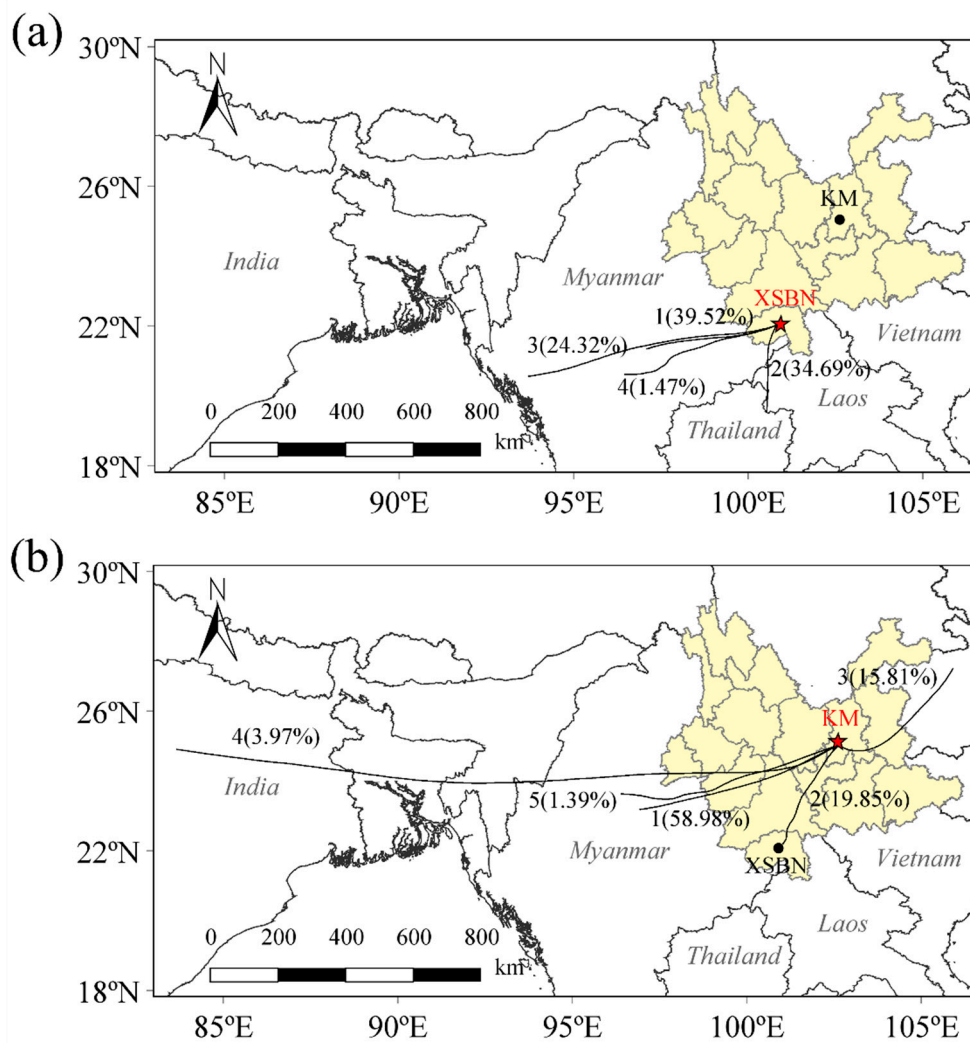
**Figure S1.** Time series of modeled and observed O<sub>3</sub> (ppbv), PM<sub>2.5</sub> (μg/m<sup>3</sup>) and AOD in various cities across Yunnan province.



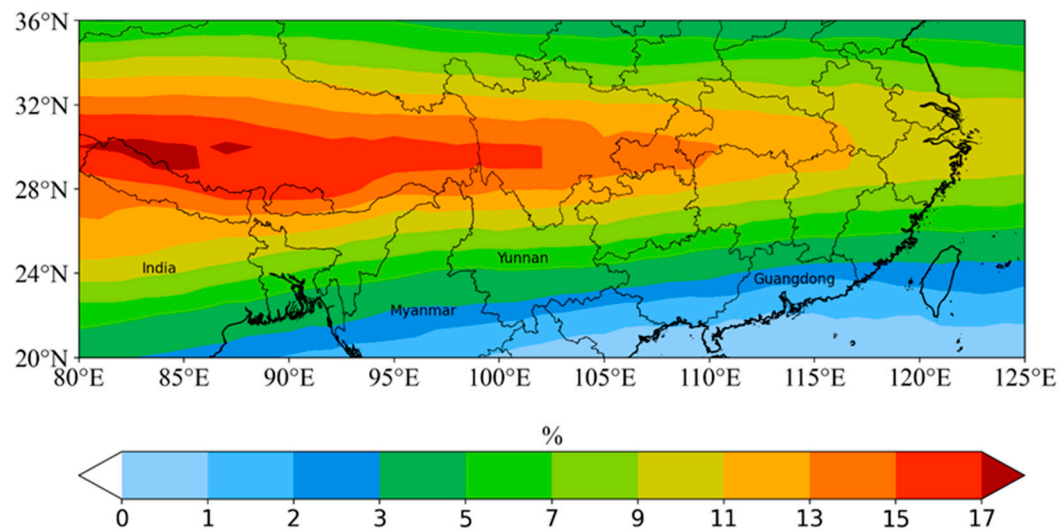
**Figure S2.** Box plots of observed (a) PM<sub>2.5</sub> (μg/m<sup>3</sup>), (b) PM<sub>10</sub> (μg/m<sup>3</sup>), (c) O<sub>3</sub> (μg/m<sup>3</sup>) and (d) 550 nm AOD in different seasons from 2015 to 2023. The red lines depict the change in the annual mean of PM<sub>2.5</sub>, PM<sub>10</sub> and AOD from 2015 to 2023.



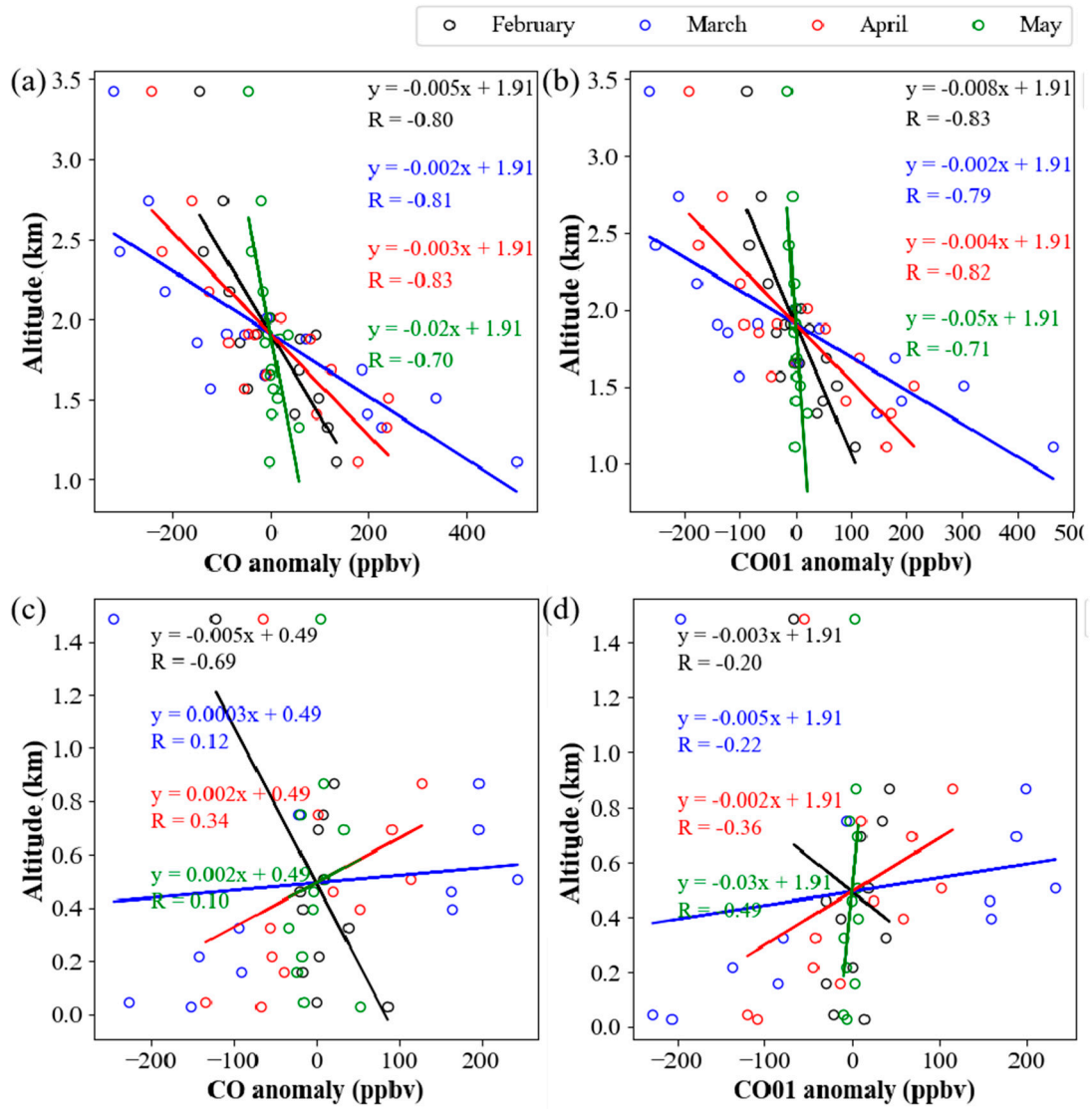
**Figure S3.** Scatter plots and linear fitting lines between AOD and (a) PM<sub>2.5</sub> (μg/m<sup>3</sup>), (b) PM<sub>10</sub> (μg/m<sup>3</sup>) in various seasons from 2015 to 2023 in Yunnan.



**Figure S4.** Backward trajectory clusters identified by HYSPLIT simulations in different target cities: (a) Xishuangbanna and (b) Kunming in spring from 2020 to 2023.



**Figure S5.** Spatial distribution of tropopause folding frequency in spring from 2001 to 2019.



**Figure S6.** Scatter plots and liner fitting lines between (a, c) CO (ppbv) and (b, d) CO01 (ppbv) from February to May in (a-b) Yunnan and (c-d) Myanmar.